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★ writes the Gottfried Baking
Company, New York City

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No service cost!

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Lifts, Pushes or Pulls

For any operation that requires pushing, pulling, lifting or lowering heavy loads, Curtis Air Hoists do the job faster, more easily and more economically—pay for themselves many times over in labor savings.

★ Production executives will find the complete report on the Gottfried installation by Mr. Charles Gottfried of vital interest. Write for your copy today.

Curtis Pneumatic Machinery Co., 1917 Kienlen Ave., St. Louis, Mo., 518 D Hudson Terminal, New York City

CURTIS

COMPRESSORS—AIR
HOISTS—I-BEAM
CRANES and TROLLEYS

December 15, 1934

AUTOMOTIVE INDUSTRIES

THE AUTOMOBILE

Volume 71 Reg. U. S. Pat. Off Number 24

JULIAN CHASE, Directing Editor
DON BLANCHARD, Editor
P. M. HELDT, Engineering Editor
JOSEPH GESCHELIN, Eng. Editor
ATHEL F. DENHAM, Detroit Editor
JEROME H. FARRIS, Ass't Editor
T. LAWTON SLAUGH, News Editor
GEOFFREY GRIER, Art Editor

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CHILTON COMPANY (Pa.)
Chestnut and 56th Streets, Philadelphia, Pa.
C. A. MUSSELMAN, President and General Manager
W. I. RALPH, Vice-Pres. G. C. BUZBY, Vice-Pres.
J. S. HILDRETH, Vice-Pres. and Director of Sales
W. A. BARBER, Secretary and Treasurer

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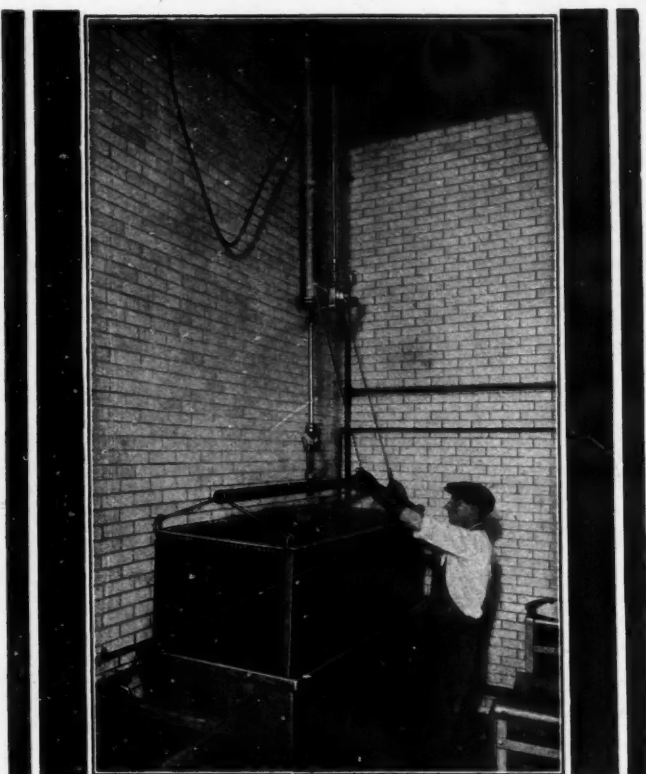
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Automotive Industries

AFL Balks at ALB Election Call

Unions Demand Settlement Repudiation and New Board

by Don Blanchard
Editor, Automotive Industries

Detroit, Dec. 11.—The Automobile Labor Board's announcement that it was about to hold at the Cadillac plant its first election for establishing a proportionally representative bargaining agency as provided in the President's automobile settlement of last March, has been greeted by a running fire of protests from American Federation of Labor headquarters here.

Federation opposition to the election plans culminated last night a resolution adopted by the District Council of the United Automobile Workers Unions in the Detroit area calling upon William Green, president of the A. F. of L., to repudiate the automobile settlement and to urge President Roosevelt to appoint a new board under Joint Resolution No. 44 for the automobile industry. The resolution also put the Council on record as refusing to participate in or be bound by elections held under the ALB's plan.

Within the industry, however, it is regarded as unlikely that Washington will do anything to disturb the automobile settlement or the ALB, at least not before the code expires.

The Council's refusal to participate in ALB elections confirmed a previous statement by F. J. Dillon, the Federation's Detroit organizer. This statement (Turn to page 723, please)

"Turret Tops" on All GM Closed Cars in '35

New Roof Is Single Sheet of Seamless Drawn Steel From Windshield to Rear

All steel roofs, known as "Turret Tops," will be embodied in practically all of the closed bodies which Fisher is building for 1935 General Motors cars.

According to E. F. Fisher, Fisher general manager, the new roof is a single sheet of seamless drawn steel extending from the windshield to a point well below the rear window. It is reinforced

with U-shaped bows, lined with one-quarter inch insulating material and its supporting members are steel. At the rear, the roof panel forms the top of the frame around the luggage compartment. In the new bodies, passengers are protected by steel on all sides, the various parts of the structure being welded into a single unit. An improved ventilation system, wider doors and more leg and headroom are other features of the new bodies.

Henderson Lifts Lid of NRA Automotive Employment Probe with Detroit Hearing

The government's investigation of automotive employment got going in a big way this week, with the public hearing which Leon Henderson, chief of NRA's planning and research division, is scheduled to hold on Saturday and Sunday afternoons in Detroit's Masonic Temple as the headline event.

The Bureau of Labor Statistics swung into action last week when a number of its field agents made a preliminary survey of the situation in the Detroit area and on the basis of their reports the Bureau is formulating the pattern for its study. The Bureau's task in the investigation is primarily that of finding facts about average annual earnings in the industry and the fluctuations in employment.

The economic aspects of the problem are being handled through Mr. Henderson's division of NRA which is considering proposals for stabilizing production and the economic consequences of such proposals. In connection with this work, it is understood that NRA put a crew of about 20 into the Detroit area on Monday of this week.

Members of the staff making the study will be available at a number of other automotive centers at times to be announced later for individual conferences with those who may wish to present orally their opinions or factual data, and who may be unable to be present at the Detroit meetings. These other centers will include: Buffalo, Cleveland, Dayton, (Turn to page 722, please)



Edward S. Jordan
Former president of the Jordan Motor Car Co. who has joined the Studebaker Sales Corp. See story on page 723

Streamlining of motor cars gives no important economies either in first cost or operating costs, Alfred P. Sloan, Jr., says in a letter to GM stockholders this week. The greatest possible gain it can give, he continued, is somewhat higher top speed and at such speeds perhaps a slight saving in fuel.

GM Nov. Sales Gain 77% Over Year Ago

Slight Recessions Noted From Oct. Totals in All Groups; 11 Mos. Figures

Consumer sales of General Motors cars in the United States during November totaled 62,752 against 69,090 for the preceding month, an approximate decrease of nine per cent; however, last month's increase over the corresponding month of a year ago was 77 per cent. Last month's sales to dealers in this country totaled 39,048 compared with 50,514 in October, a decrease of about 23 per cent. November sales in 1933 to dealers were 3,483, giving the same month of this year an increase of 810 per cent.

Sales for the first 11 months of this year to consumers in the United States were 885,963 units compared with 743,827 in the corresponding months of last year. This represents an approximate increase of 19 per cent. November sales to dealers in this country for the January-November period were 931,150 compared with 718,010 for the same months one year ago; an increase of about 30 per cent.

Detailed comparative figures follow:

	Sales to U.S. Consumers	Sales to U.S. Dealers	World Sales to Dealers
Nov., '34	62,752	39,048	61,037
Oct., '34	69,090	50,514	72,050
Nov., '33	35,417	3,483	10,384
11 Mos., '34	885,963	931,150	1,198,353
11 Mos., '33	743,827	718,010	869,035

Ohio Statute Diverting Gas Tax Held Invalid

The Ohio Supreme Court has ruled invalid a statute diverting a portion of the gas tax collections for poor relief. In an opinion written by Judge Robert N. Wilkin, he stated that the state legislature had failed

to permit poor relief diversions from gasoline taxes when it re-enacted the gasoline tax last year.

Governor George White of Ohio allowed the diversion statute to become law without his signature. His action was interpreted at the time as signifying that the measure would be involved in technicalities when and if put in force.

Studebaker's Caravan Drivers Get Code Wages

In the future drivers of cars in Studebaker caravans sent by the Studebaker Sales Corp. to Pacific Coast destinations will be paid code wages and offered free transportation back to South Bend, according to a communication sent to NRA by Studebaker executives. NRA officials say this move will give remunerative employment to about 500 men and boys and materially decrease the West Coast's "floating" population.

Studebaker took this action, it was said, after its attention had been called to the additional relief burden placed upon coastal states by the practice of engaging transients to drive fleets of cars from the factories without pay. Paul G. Hoffman, Studebaker trustee

and president of the sales organization, wired the NRA Compliance Director at San Francisco that his company had notified all Pacific coast branches that Studebaker caravan drivers were to be paid the code wages and furnished with the necessary free return transportation to the factory.

"This plan," Mr. Hoffman's wire said, "should substantially aid in decreasing unemployment in your territory, as approximately 500 men will be put to work immediately. Very glad of opportunity to cooperate with you in splendid work you are doing . . ."

DeSoto to Present New Airflow Models

The DeSoto Motor Corp. will present a new line of Airflow models for 1935, according to Byron C. Foy, president of the DeSoto Motor Corp. Mr. Foy's statement was the first indication of what DeSoto is planning for the coming year.

Mr. Foy said the date for the presentation of the new Airflow DeSotos has not been set. He indicated, however, that the cars would be announced within a few weeks.

Company Treasury Not Way to Higher Wages, Shorter Hours, Says Cameron

Dipping money from a company's treasury will not establish higher wages or shorter work hours, W. J. Cameron of the Ford Motor Co. told radio listeners during a recent Ford broadcast. Such social improvements come from economies, refinements of manufacturing methods, from the incessant labor and

creative experience of management, Mr. Cameron pointed out.

In opening his talk Mr. Cameron said: "Our grandfathers worked about three times as long in the week, and our fathers twice as long as we do. The work-week of our children will be shorter than ours, and yet will produce more. This continuous decrease in standard working hours is due, not to a growing scarcity of work to be done, but to the better ways of doing it.

"Social improvements of this character are not commanded but created. The difference between politics and industry in this matter is that we cannot just make a speech about it and consider the thing done. And we can't tax the public to pay for it. What we do must not only pay for itself but register its benefits on the payroll. Reformers have the advantage of us there—they don't have to meet payrolls.

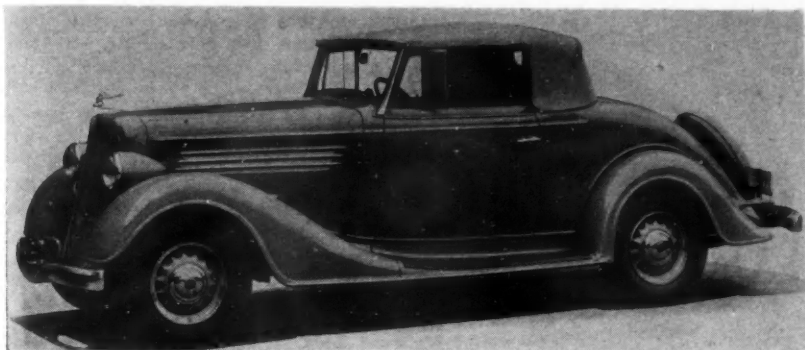
"Higher wages and shorter hours cannot be established by money dipped out of a company's treasury. They come from economies, improvements and refinements of manufacturing methods, and these come from the incessant labor and creative experience of managements. That is the only way any social advance is built into industry. It cannot be done by law; it cannot be done by money. The right method and the right condition must be created."



Revolving service stations are the latest. This photograph shows the architect's perspective of the new Rotary Servicenter being erected in New York, by the Colonial Beacon Oil Company. Motorists drive on to a turntable which revolves around the station's dispensing equipment. Less than two minutes is required to service an automobile with oil, gas, water and air and send it on its way.

December 15, 1934

Automotive Industries



Buick is continuing its 40, 50, 60 and 90 Series cars in 1935 with refinement and changes tended mainly to increase passenger comfort and convenience. Extensive changes have been made in upholstery and interior trim, particularly in the lower priced groups. A new type of rubber engine mounting which more effectively insulates the engine from the frame, is a new mechanical feature. More room has been provided in one sedan model by redesigning the front seat. It is understood that prices are the same as on the 1934 models. A new convertible coupe, shown above, is priced at \$925, and has been added to the Series 40 line. This new model is upholstered in Bedford whipcord or in hand buffed leather.

Dealers Forming Platform On Factory Relationship

Condemnation of certain specific provisions in some factory-dealer contracts and recommendations for stipulations designed to make future contracts between factories and dealers more "equitable" are expected when the annual meeting of the National Automobile Dealers Association is held in Detroit, January 14 and 15. In anticipation of this move, dealers have been asked, through their state and local associations, to make suggestions which, it is understood, are to be embodied in a resolution to be offered for dealer approval at the meeting.

The proposed resolution is expected to become the platform upon which the N.A.D.A. dealers will seek to "collectively obtain relief from the inequalities imposed on them by the manufacturers through the unfair, unjust and inequitable provisions of factory contracts, which are grossly opposed to economic rehabilitation of the Motor Vehicle Retailing Trade—."

Rules for Handling Code Funds Are Issued by NRA

Regulations have been issued by the NRA for the government of all code authorities in handling money collected for code administration purposes. Briefly these regulations provide:

That the person handling the funds must provide adequate security for the money in his keeping; all money must be kept in a separate fund in code authority's name; accurate accounting records must be kept at all times, and available for inspection at any time; an independent audit must be made

at the end of each budget period; an accounting of all funds must be published not later than 60 days after budget closing date to members of trade or industry who have paid assessments or otherwise contributed to the fund.

O'Neil Joins NRA

James L. O'Neil, operating vice-president of the Guaranty Trust Company of New York, has been appointed control officer of NRA. He will have charge of administration procedure, financial affairs, office management and personnel, assisting W. A. Hariman, administrative officer.

New Ford Trucks Have Improved Brake, Softer Clutch, Crankcase Ventilation

Ford's 1935 V-8 trucks are out with important design improvements. These include a crankcase-ventilating system, a softer clutch and improved braking and cooling systems. Better load distribution and increased driver comfort are incorporated in the new design.

Although 49 improvements have been made in the new truck, only a single change has been made in the engine, that of a directed-flow crankcase-ventilating system.

Described as the Ford V-8 "double-duty" truck—because it is said to combine the speed necessary for fast delivery with the power and ruggedness required for heavy-duty service—the 1935 line includes seven types. Special attention has been given to smartness of appearance, and all of the models have a new front-end, a new cab design, and wider and deeper fenders with large skirted aprons.

AMA Members 11 Mos. Total 33% Over 1933

Jan. - Nov. Production Exceeds Whole of Year's Output by 434,589 Units

The January-November output by member companies of the Automobile Manufacturers Association shows a 33 per cent increase over the corresponding period of last year, according to a report released late last week by the AMA. The 11 months' total, which does not include the Ford Motor Co. production, approximately 800,000 cars and trucks, is 1,926,441. Not only does this total exceed the total for the same months of last year, but also the total for all of 1933. Last year's January-November total was 1,451,729, and the year's total was 1,491,852.

A summary of the AMA member company's output follows.

November, 1934	76,798
October, 1934	94,003
November, 1933	47,418
11 Months, 1934	1,926,441
11 Months, 1933	1,451,729
Total, 1933	1,491,852

Triphagen Appoints 3 Sales Officials

C. A. Triphagen, Reo sales manager, has announced the addition of three men to the company's sales organization. They are W. Ward Mohun as a special representative; C. F. Watson, divisional sales manager in charge of the western and southern territory, and Charles Boutelle, as manager of the eastern division. Both Mr. Watson and Mr. Boutelle have been associated with Reo for several years. Mr. Mohun formerly was with the Willy-Overland organization.

The truck is available in two lengths of wheelbase, 131½ and 157-in., and the following types: 131½-in. chassis—panel, platform, stake, hydraulic dump, cab and chassis with dual wheels, and auxiliary springs for tractor use; 157-in. chassis—platform and stake.

Additional room on the chassis has been obtained by moving the engine forward, thereby increasing the distance from the back of the cab to the rear-axle axis by 6.5 in. This moved the center of gravity forward, and more load is now carried on the front axle, with the result that the brakes are more effective and tire wear is more nearly equally distributed. It also permits of acute-angle turns with full-width semi-trailers and reduces the body overhang.

We expect to illustrate and describe some of the mechanical features of the new truck in an early issue.

Scarratt, Harvester Chief Motor Engineer

**Truck Expert Supervises
All Automotive Activity;
W. D. Reese Also Promoted**

A. W. Scarratt, who for several years has been engineer in charge of the International Harvester Co.'s motor truck engineering division, has been made chief engineer in charge of all the company's automotive engineering activities. Aside from supervising engineering development of motor trucks, as heretofore, Mr. Scarratt will also have charge of similar work on McCormick-Deering tractors and stationary and portable power plants.

From 1914 to 1926 Mr. Scarratt held the position of tractor engineer and later chief mechanical engineer for a well known manufacturer of such vehicles. In 1927 he joined the staff of International Harvester. Among some of Mr. Scarratt's most recent contributions to the motor truck field is the new line of streamlined International C trucks recently announced. This line consists of nine models ranging from one-half ton to 5 ton size.

Mr. Scarratt has been active in the S.A.E. for several years, and has been a member of the motor coach and motor truck committee and of the lubricants division committee.

Mr. Scarratt will be succeeded in his former position by his assistant, W. D. Reese, who recently joined the International Harvester organization. Mr. Reese has been actively engaged in motor truck engineering for many years, and has played an active part in the S.A.E. At present he is a member of the society's truck rating committee and the rim committee.



A. W. Scarratt

limit of 48 hrs. per week has reduced average annual earnings by increasing the number of temporary workers during peak periods. There is some reason for thinking that increasing this limit to 56 hrs., without disturbing the requirement that average annual hours must not exceed 40 per week, might do as much as anything else that may be suggested to increase average annual earnings. This perhaps is too simple a solution to receive consideration.

Among the proposals that have been made for regularizing demand are seasonal changes in prices to encourage buying in what are now off-peak periods, possible development of markets in the southern hemisphere where the seasons are the reverse of ours, and the possible revision of state registration laws to eliminate any tendency they may have to accentuate natural seasonal forces. None of these expedients, however, seem to promise much.

Considerable confidence is felt in the industry that nothing unduly restrictive of sales will grow out of the present investi-

gation, and that no corrective measures will be applied that will bear unduly on some of the financially weaker members of the industry.

The National Automobile Dealers Association has reserved time on the hearing program. Whether it will make a presentation however depends on developments at the time. The dealers already have registered their opposition to the staggered model proposal because of its unsettling effect on the retail market.

The A. F. of L. is planning to have 40 to 50 workers present to testify at the hearings as to earnings and conditions within the plants. It will urge the 30-hour week and will attack the industry's handling of older workers, the group bonus and alleged long hours worked by maintenance employs.

Secretary of Labor Perkins, quoted in a special dispatch to the *Detroit Free Press* this week, stated that it is difficult to work out an employment stabilization plan for the automotive industry so long as four factions seek to represent the workers. The four factions Miss Perkins referred to are: the MESA, A. F. of L., the Associated Automobile Workers, and the company unions. The inference drawn from this statement is that the Secretary of Labor thinks the workers should be represented by only one organization.

The *Free Press* story also says that the National Industrial Recovery Board has conceded that the early abolition of the Automobile Labor Board is likely.

If one organization should represent the workers, the American Federation of Labor apparently feels that it has a mandate to be that organization. At least, this is suggested by a statement made by Francis J. Dillon, A. F. of L. organizer in Detroit, in Pontiac last Sunday. He said: "Let it be understood that the MESA, the Associated Automobile Workers, company unions and all other rump and impossible aggregations are out so far as the American Federation of Labor is concerned."

Employment Probe

(Continued from page 719)

Flint, Lansing, Milwaukee, South Bend, Toledo, Muskegon, Jackson, Indianapolis and Milwaukee.

Presentations at the Detroit hearing will be limited to the regularization of employment and related matters. Discussions of Section 7a will not be in order, which means that arguments over the merit clause, representation, etc., are out.

At the present time, the most important phase of the inquiry is the fact-finding work being done by the Bureau of Labor Statistics. By comparison of the automotive data developed in this manner with facts about annual earnings in other industries which the Bureau has secured in previous surveys, it should be possible to determine whether seasonal fluctuations in automotive production do pull average earnings down as much as has been alleged, or whether average annual automotive earnings do stack up rather well with other industries, as BLS indexes suggest is the case (AI, Dec. 1, page 663).

It is to be hoped too that the facts developed by the Bureau of Labor Statistics will throw light on the extent to which the code

Chrysler Buys Interest in Commercial Credit Co.; To Announce New Rates

In announcing the acquisition of a substantial minority interest in the Commercial Credit Co. of Baltimore, by the Chrysler Motors Corp. Walter P. Chrysler, chairman, said the 1935 distributor franchises contain a clause providing that all Chrysler products sold on a time payment basis shall not carry a larger financing charge than that set forth in the official Chrysler Motors-Commercial Credit Co. plan for any given territory.

Chrysler and Commercial Credit have been associated in the financing of instalment sales for many years. This connection was first made at the time of the introduction of Chrysler products to the public; prior to that Commercial Credit was associated with the old Maxwell-Chalmers organization out of which grew the Chrysler corporation. Discussing this

new arrangement Mr. Chrysler said:

"We regard this new arrangement as accomplishing our purpose to provide a service competitive with anything now available. New and advantageous rates will shortly be announced for the official Chrysler Motors-Commercial Credit plan and will be in keeping with the ever present demand of the public for maximum value. The new distributor franchise for 1935 will carry a proviso that all Chrysler Motors products sold to the public on a time payment plan basis shall not carry a larger financing charge than the charge set forth in the official Chrysler Motors-Commercial Credit Co. plan for the territory."

A. E. Duncan, chairman of the Commercial Credit board, said his company expected that the new arrangement will substantially enlarge its business and that the company will continue to expand its facilities in financing instalment sales of automobiles and products of other manufacturers.

Spielman Code Case Before Supreme Court

For the first time since prosecutions of alleged code violations have been instituted in the name of the administration's recovery program the United States Supreme Court has announced it will hear arguments in two cases attacking and defending the constitutionality of NRA. One of the two cases is the Spielman Motor Sales Corp. of New York, involving trade-in allowances and price fixing provisions of the Motor Vehicle Retailing Code. Arguments on this case probably will be heard about the middle of January. The other case involves the oil code.

The Supreme Court this week made a notation of probable jurisdiction in these cases, and as a result of this action now is free to proceed to a decision of the case after arguments are heard, or rule that it has no jurisdiction.

The Spielman case is based upon a three-judge Federal court decision in New York last Oct. 9 upholding the constitutionality of the Recovery Act, NRA, et. al., and the Shackno Act, the New York NRA enabling law. The Spielman organization sought an injunction against W. C. Dodge, New York County District Attorney from enforcing the Shackno Act, and its attorneys at the same time argued the unconstitutionality of the Recovery Act and the dealer code, especially the provisions dealing with maximum trade-in allowances.

Judges Manton, Patterson and Hubert who heard the argument in New York denied the plea for the injunction, and upon this decision the appeal was taken to the Supreme Court.

AFL Balks at Election Call

(Continued from page 719)

was made with the full support of Mr. Green who telegraphed "I concur in your judgment that members of our local unions should not participate in any election ordered by the Automobile Labor Board."

It is understood that other A. F. of L. locals outside the Detroit area also will take action in line with the resolution.

In the various statements issued by Mr. Dillon, he makes it clear that the Federation stands firm for majority rule, its acceptance of proportional representation in last spring's automobile settlement notwithstanding.

It has been generally believed, of course, for some time that Federation strategy contemplated scrapping the automobile settlement and the ALB with it, and the substitution therefor of a board named by the President under the Joint Resolution, which board on

Chevrolet Sets 1935 Goal at 750,000 Cars

A goal of 750,000 cars for the 1935 season has been set by the Chevrolet Motor Co. for domestic retail sales, it was announced this week at a regional and zone sales executive staff meeting in Detroit.

R. H. Grant, vice president in charge of sales, told the field organization that no more dealers should at any time be put into a territory than the market can bear and still return a profit to the dealers on their capital investment.

past performances of other similarly created agencies, would be expected to apply the majority rule. But last night's resolution is the first time that its Detroit headquarters has come out definitely for repudiation of the settlement.

The ALB election rules to which the Federation is objecting follow in full:

The following is an outline of the procedure the Automobile Labor Board proposes to follow in conducting elections for representatives of employees of the Cadillac plant under the terms of the President's Automobile Settlement of March 25, 1934.

1. These elections will be conducted entirely by representatives of the Automobile Labor Board and all ballots, notices and communications to the employees will be handled by the Board. A sufficient number of election officials will be present to insure every voter an opportunity to cast his vote freely and without intimidation or improper influence on the part of anyone and to insure secrecy. All ballots and records will remain in the possession of the Board.

2. Each plant will be divided into voting districts, the number and size of which will be subject to final determination by the Board.

3. Employees, such as foremen, sub-foremen or group or gang leaders, who act in a supervisory capacity, will not be eligible to vote.

All employees working at the time of the elections and all other employees in Classes B, C and D of the Board's Rules of Seniority of May 18, 1934, will be entitled to vote in these elections.

4. A primary election will be held in each voting district. In this election each voter will nominate one person for representative of his voting district and he will also be given the opportunity, which he is free to avail of or not avail of, to indicate the group, if any, with which his nominee is identified. Representatives will not be restricted to employees. The two nominees receiving the largest number of votes in each voting district will have their names printed on the final ballot, together with their group affiliation, if any was indicated.

5. The nominating ballots for the entire plant will be tabulated to determine the total number specified for each labor group. Those who do not specify a group will be treated as a group. This tabulation will determine the relative proportion of representatives on the bargaining agency to which each group containing a substantial number is entitled.

6. In the final election the candidate who received the largest number of votes in each district will be the representative of that voting district, and a member of the bargaining agency.

7. If the representatives receiving the largest number of votes for all districts do not provide proportional representation for all substantial labor groups in the plant, in substantially the proportion ascertained as provided in Paragraph 5 above, sufficient additional representatives will be added from among candidates receiving the next highest votes in the plant in any groups entitled to more representatives on the bargaining agency. The representatives elected by departments, together with those so added, if any, will constitute the bargaining agency.

The bargaining agency will have power to function by committee if that is found desirable.

E. S. Jordan Joins Studebaker Sales

Hoffman Secures Services of Former Manufacturer

Edward S. Jordan, pioneer automobile manufacturer, and formerly president of the Jordan Motor Car Company, Cleveland, Ohio, has joined the Studebaker Corporation, according to an announcement by Paul G. Hoffman, president of the Studebaker Sales Corporation of America.

Mr. Jordan has been connected with the automobile business for the past 27 years. Leaving the National Cash Register Company in 1907 he became associated with Thomas B. Jeffery, one of the earliest builders of motor cars and the predecessor of Charles W. Nash in the manufacture of automobiles in Kenosha, Wis. For nearly 10 years Mr. Jordan was associated with Mr. Jeffery, having considerable success as a sales manager. He organized his own company in Jan., 1916, and with the distinctive type of advertising employed, and his frequent appearances before dealer organizations as a speaker on automobile manufacturing trends, achieve another success.

Dodge Shows '35 Models in Detroit

Dodge 1935 models are on public display in Detroit this week. The new models are characterized by a new front end and hood treatment, increased windshield slope and more slanting rear panels. The delivered price on the four-door sedan is quoted at \$870.

Independent front suspension has been dropped and in its place are soft semi-elliptic springs mounted in the conventional manner with a torsion bar stabilizer on the front axle, the design being similar to that illustrated for Plymouth last week.

The radiator grille is further forward than last year, and presumably weight has been redistributed to put more load on the front springs. The grille is narrower and curves backward at the bottom. The radiator shell carries the headlamps while the twin horns are concealed behind grilled openings in the sheet metal between the hood and the fenders. A new louvre treatment has also been adopted. Salesroom literature indicates that among the new features are air-cooled generators, vacuum spark control, ventilated clutch, spray-cooled exhaust valves, and body ventilation provided by backward movement of the window glasses. Eight body models in all are illustrated.

Employer-Employee Problems Solved Best By Works Council, Sloan Says

The works council is the best solution of the problem of maintaining the highest possible degree of cooperation and the most harmonious relationships between employers and employees, Alfred P. Sloan, Jr., president of General Motors, declared this week in a speech before the Illinois Manufacturers Association in Chicago. He also took issue with 30-hr. week proposals and code provisions protecting the inefficient, and warned against the social and economic consequences of continued large scale spending by the government.

Discussing labor relations, Mr. Sloan said: "It cannot be denied that the great majority of problems in which the employer and employee are vitally concerned revolve around the specific conditions of individual employer-employee relationships. Our ability to deal intelligently with any question is importantly enhanced by intimate and complete knowledge of all the elements involved. For all these, and many other

reasons . . . I am convinced that the real answer to the question is . . . the works council plan."

Subsequently Mr. Sloan asked: "Will the social and economic welfare of the American worker be further enhanced if we adopt, as an instrumentality of employer-employee relationships, in place of the works council, a national organization—an outside interest as against an inside interest? If the answer is 'yes,' then that is the route we should follow . . . If we follow the outside route, there is only one result—the domination of the American worker. He is no longer free and independent. He will be compelled to pay a price for his job. A national union implies the closed shop . . . I am entirely out of sympathy with the principles and implications of this course of procedure.

"Now why am I out of sympathy with this solution of the problem? First, I believe that workers should be free. Their right to work should not depend upon their membership in a labor organization. Second, it is axiomatic in employer-employee

relationships that organized labor, as such, can never be satisfied. It cannot afford to be satisfied, for being dissatisfied is the very foundation of its continued existence. It is the necessity of never stopping in its demands that forces leaders of organized labor to exert an unsound influence. . . .

Continuing, Mr. Sloan urged that the worker should be protected by law from coercion from any source, not merely interference on the part of his employer.

While admitting that shorter working hours were a desirable long-pull objective, Mr. Sloan contended that the shortening process should be one of evolution, not revolution.

"Reduction in the real cost of goods and services is the inevitable by-product of technological advance. It should be capitalized in two ways:—In increasing the hours of leisure, hence promoting the social advancement of the worker; and in expanding consumption, resulting in the creation of additional employment through the instrumentality of lower prices, thus promoting the economic welfare of the workers as a whole," he said.

"I am encouraged at the moment," Mr. Sloan said in conclusion, "as I believe you should be, by the increasing respect that is developing for the ability to create—for those who provide the payrolls that make the wheels go around—the production payrolls

10 Months' U. S. Retail Car Sales Valued at \$1,182,000,000

U. S. New Car Registrations and Estimated Dollar Volume by Retail Prices Classes—10 Months

			UNITS		Per Cent of Total		ESTIMATED DOLLAR VOLUME*		Per Cent of Total	
	1934	1933	Per Cent Change	1934	1933	1934	1933	Per Cent Change	1934	1933
Chevrolet, Ford and Plymouth	1,242,647	929,373	+ 33.7	72.87	69.36	\$759,000,000	\$511,700,000	+ 48.3	64.22	58.41
Others Under \$750	73,429	224,901	- 67.4	4.31	16.78	50,000,000	146,300,000	- 65.8	4.23	16.70
\$751-\$1,000	316,711	102,989	+208.0	18.57	7.69	255,500,000	85,300,000	+199.7	21.62	9.74
\$1,001-\$1,500	47,567	53,493	- 11.2	2.79	3.99	58,300,000	62,200,000	- 6.2	4.93	7.10
\$1,501-\$2,000	12,141	11,236	+ 8.1	.71	.84	22,100,000	18,600,000	+ 18.9	1.87	2.12
\$2,001-\$3,000	9,499	13,146	- 27.7	.56	.98	24,400,000	32,500,000	- 24.9	2.06	3.71
\$3,001 and over	3,258	4,804	- 32.2	.19	.36	12,700,000	19,500,000	- 34.9	1.07	2.22
Totals	1,705,252	1,339,942	+ 27.3	100.00	100.00	\$1,182,000,000	\$876,100,000	+ 35.0	100.00	100.00
Miscellaneous	268	1,048								
Totals	1,705,520	1,340,990								

U. S. New Car Registrations and Estimated Dollar Volume by Retail Price Classes—October

			UNITS		Per Cent of Total		ESTIMATED DOLLAR VOLUME*		Per Cent of Total	
	1934	1933	Per Cent Change	1934	1933	1934	1933	Per Cent Change	1934	1933
Chevrolet, Ford and Plymouth	98,957	98,556	+ 0.4	70.26	72.34	\$55,300,000	\$55,100,000	+ 0.4	62.77	63.63
Others under \$750	4,847	22,315	- 78.3	3.44	16.38	2,800,000	14,600,000	- 80.9	3.18	16.86
\$751-\$1,000	31,611	9,489	+233.0	22.44	6.97	23,000,000	6,500,000	+262.0	26.10	7.51
\$1,001-\$1,500	3,294	3,360	- 2.0	2.34	2.47	3,500,000	3,900,000	- 10.3	3.97	4.50
\$1,501-\$2,000	903	571	+ 58.1	.64	.42	1,300,000	1,000,000	+ 30.0	1.48	1.15
\$2,001-\$3,000	1,001	1,533	- 34.9	.71	1.13	1,400,000	4,000,000	- 65.0	1.59	4.62
\$3,001 and over	245	398	- 38.5	.17	.29	800,000	1,500,000	- 46.6	.91	1.73
Total	140,858	136,227	+ 3.2	100.00	100.00	\$88,100,000	\$86,600,000	+ 1.9	100.00	100.00
Miscellaneous	22	99								
Total	140,880	136,326								

* All calculations are based on list price F. O. B. factory of the five passenger, four-door sedan, in conjunction with actual new car registrations of each model. The total dollar volumes for the different models are then consolidated by price classes.

In calculating estimated dollar volume for October and ten months deductions of 10 per cent were made on cars \$1,000 and under, and 15 per cent on all cars over \$1,000, with the exception of Ford, Auburn and Packard, to allow for clean up sales by dealers.

as distinguished from the synthetic payrolls—and the increasing lack of confidence in the thinking that has prevailed—that still too widely prevails—that the way back to prosperity is to spend more and work less. Today the magic possibilities of industrial regimentation and the so-called planned economy, no longer cast the spell of yesterday—that spell is broken. . . . Men are becoming increasingly aware that the strongest instrumentality of revival and reconstruction is the existing system of free enterprise."

GM's Export Men Back for Holidays

Many of the General Motors officials who have been abroad on business and those who are stationed at foreign plants are arriving in New York almost daily for the Christmas holidays. Among the first to arrive were W. T. Whalen, vice president of GM Export Co. and regional director for South America and South Africa, and Mrs. Whalen, who have been on a three months' visit to Port Elizabeth.

T. W. Tinkham, also a GM Export Co. vice president, recently returned from Europe; R. A. May, managing director of General Motors Japan, has arrived for a short visit to the home office of the export company. W. McHardy Forman, managing director of General Motors New Zealand, also is in New York visiting the export company office before going to England for a short vacation.

D. F. Landin, managing director of General Motors International in Copenhagen, arrived this week. He was accompanied by Mrs. Landin, E. R. Palmer, assistant general manager of Adam Opel, also is in New York. He arrived this week at the same time the Landins came.

C. D. Overman, General Motors Argentina production and supply manager, accompa-

Nine Independents Average 1.8% Return in 5-Yr. Period; GM-Chrysler Earn 12.7%

Net Earnings as a Per Cent of Net Worth*

	1929	1930	1931	1932	1933	Five-Year Average Per Cent
	Per Cent	Per Cent	Per Cent	Per Cent	Per Cent	
General Motors-Chrysler....	26.7	15.3	10.2	-1.3	10.6	12.7
Nine Independents°	18.7	4.2	-4.9	-11.4	-7.3	1.8
Total—11 Companies	24.4	12.5	6.7	-3.5	7.0	10.1
	Dividends as a Per Cent of Net Worth*					
General Motors-Chrysler....	17.9	15.0	15.1	7.7	7.5	12.8
Nine Independents°	14.1	11.7	7.3	3.6	1.4	8.6
Total—11 Companies	16.8	14.2	13.2	6.8	6.3	11.8

* Net Worth as used here is capital and surplus less intangibles.

° Auburn, Graham, Hudson, Hupp, Mack, Nash, Packard, Reo and White. Comparable data are not available for Ford. Studebaker data not complete for period.

Due to an unfortunate typographical error in this table as it appeared in last week's issue, we are reproducing here correctly.

nied by Mrs. Overman, sailed late last week for South America after a short vacation in this country spent visiting GM domestic factories. P. L. Herbert and Mrs. Herbert left New York last week for Bombay, where Mr. Herbert is assistant production manager of GM India. R. N. Stevens, body superintendent of GM Continental in Antwerp, has returned to Europe following a short vacation in this country. S. V. Pedersen, supply manager of General Motors Nordiska, Stockholm, sailed last week for Sweden.

ACF's Ky. Plant Active

The American Car and Foundry plant in Jeffersonville, Ky., has opened after a year's idleness with a small force of 25 men at work on a contract to supply the Colgate-Palmolive-Peet Company with a number of motor trucks.

Graham Shipments Up 46% In 11 Mos. From '33 Total

A gain of 46.4 per cent in numbers of cars shipped in the Jan.-Nov. period of this year over the corresponding period of 1933 was recorded by the Graham-Paige Motors Corp. according to a pamphlet "Looking Forward," just released by the company. In the 11 month period 15,724 Graham cars were shipped from the factory, the brochure states.

The pamphlet also confirms a previous announcement that the corporation will produce a new low-priced Six to give Graham dealers a better competitive position, and which will broaden these dealers' markets to 98.9 per cent of the total automobile market. At the start, production on this new line, it is stated, will be restricted to two models—a four door and two door sedan.

The Graham organization has planned to entertain practically the entire dealer organization in Detroit the week of the N.A.D.A. meeting (Jan. 12). A. I. Philp, vice president and general sales manager of Graham, has announced that the Graham dealers will be entertained at luncheon in the Book-Cadillac Hotel, Jan. 16 at which time 1935 sales plans will be explained.

Borg-Warner Inaugurates Clutch Exchange Service

A new factory built-clutch exchange service has been included in the clutch merchandising program of Borg-Warner Service Parts Co. (Division Borg-Warner Corp.), effective immediately, A. C. Darling, vice-president and general manager, has announced.

Under the new program Borg-Warner Service Parts Co. will furnish a complete factory built exchange service on cover assemblies and a large number of the driven plates for all passenger cars, trucks and buses.



The front end of the 1935 Plymouth chassis. 1—Semi-elliptic front springs with tapered leaves. They are made of "Mole" alloy and have an approximate frequency of 90 as compared with 85 for the rear springs. 2—The double-acting shock absorber. 3—The ride stabilizer, a torque rod providing additional stiffness against opposed deflection of the front wheels.

Business in Brief

Written by the Guaranty Trust Co., New York, exclusively for Automotive Industries

The upward trend of general business activity continued last week. Retail sales improved toward the end of the week as the weather became colder. All indications thus far point to the largest Christmas business since 1929. Industrial activity continued to improve, with increased steel operations.

Car Loadings Fall

Railway freight loadings during the week ended December 1 totaled 488,118 cars, which marks a decrease of 73,195 cars below those during the preceding week, a decrease of 11,478 cars below those in the corresponding period last year, and a decrease of 58,977 cars below those in the corresponding period two years ago.

Current Output Gaining

Production of electricity by the electric light and power industry in the United States during the week ended December 1 was 8.4 per cent above that in the corresponding period last year. The current figure, however, was below that for the preceding week.

Farm Prices Unchanged

According to the Bureau of Agricultural Economics, the farm price index on November 15 stood at 102, showing no change from the figure for a month earlier. The current index is 22 points

above that a year ago. The index of prices paid by farmers for the commodities they consume stood at 126, which is also the same as that for a month earlier.

Crude Production Up

Average daily crude oil production for the week ended December 1 amounted to 2,372,200 barrels, which exceeded the Federal allowable quota by 32,400 barrels, as compared with 2,369,100 barrels for the preceding week and 2,195,050 barrels for a year ago.

Milling Drops

Flour production during November amounted to 5,373,754 barrels, as against 6,023,600 barrels during the preceding month, and 5,394,331 barrels during the corresponding period last year.

Fisher's Index

Professor Fisher's index of wholesale commodity prices for the week ended December 8 stood at 78.7, as against 79.0 the week before and 78.9 two weeks before.

Federal Reserve Statement

The consolidated statement of the Federal Reserve banks for the week ended December 5 showed a decrease of \$2,000,000 in holdings of discounted bills. Holdings of bills bought in the open market and of government securities remained unchanged.

new Bankruptcy Act, covering debtor relief which makes bankruptcy proceedings unnecessary. This move has been made in an effort to further clear the path for reorganization of the parent company.

Judge George P. Han, who received the petition, has set Jan. 6 for the hearing and has named David R. Wilson, trustee of the Willys-Overland Co., trustee for the underlier. The whole action, if approved will be carried out under Mr. Wilson's direction.

Hudson-Terraplane Prices

Terraplane Special Six			
	1935	1934	Change
Coupe	\$585	\$600	—\$15
Coach	595	615	— 20
Sedan	655	675	— 20
Coupe 4 Pass.	625	645	— 20
Conv. Coupe	695	695	..
Terraplane Deluxe			
	1935	1934	Change
Coach	\$645	\$680	—\$35
Coupe 2-4 Pass.	675	710	— 35
Sedan	705	740	— 35
Conv. Coupe	725	750	— 25
Coupe 2-Pass.	635	665	— 30
Hudson Special Series			
	1935	1934	Change
Coach	\$790	\$745	+\$45
Sedan	840	805	+ 35
Coupe 2-4 Pass.	810	775	+ 35
Coupe	725	760	+ 35
Conv. Coupe	860	835	+ 25
Hudson Deluxe			
	1935	1934	Change
Coach	\$875	\$835	+\$40
Sedan	935	895	+ 40
Coupe 2-4 Pass.	895	855	+ 40
Coupe	845	815	+ 30
Conv. Coupe	955	..	..
Custom Eight			
	1935	1934	Change
Club Sedan	\$1125	\$1070	+\$55
Brougham	1195	1145	+ 50

"Electric hand" standard on Hudson custom eight; \$20.00 extra other models. With automatic clutch the price is \$27.50 extra. Special models have same equipment as 1934 Deluxe, with the exception of radio.

Chrysler Inaugurates New Car Service Department

A new car service department to insure the uniform inspection, conditioning and servicing of all 1935 De Soto and Chrysler cars, was announced this week by D. A. Wallace, vice president of the Chrysler Motor Corp.

With the new department in operation, the only responsibility of the dealer upon delivering the new car is to see that there is oil in the crankcase and water or non-freeze in the radiator. All other conditioning operations are taken care of at the factory.

Stock Increase Planned by Toledo Stamping Co.

The Toledo Stamping & Manufacturing Co. has amended its charter to increase capital from 250 to 750 shares of no par common stock. The company has been growing rapidly. It was founded

by J. A. Bingham, former head and organizer of the Bingham Stamping & Tool Co. Edwin Tasker is president. The company employs about 200 workers and occupies a part of the former Bock Bearing Co. plant in West Toledo.

High Prices Force Army to Cut Plane Purchases

Increased prices will force the Army Air Corps to reduce approximately 40 per cent the number of airplanes to be purchased during the coming fiscal year. One manufacturer is reported to have increased the price per unit 300 per cent.

Plan Reorganization of W-O Selling Subsidiary

A petition has been filed with the Federal Court at Toledo asking approval of a plan for the reorganization of Willys-Overland, Inc., selling subsidiary of the Willys-Overland Co. The petition has been made under Section 77-B of the

Chrysler Dealers' New Car Orders Total 100,566

The Chrysler Corp. has reported receipt of dealer orders for 100,566 of 1935 models on all lines.

Preliminary showings of new De Sotos, Chryslers and Plymouths were held here this week for press representatives. Orders include 12,000 cars for export and Canada, and total Plymouth orders of 50,000, according to a statement by D. S. Eddings, Plymouth general manager.

Maxon to Handle Reo Overseas Advertising

Overseas advertising of Reo Motor Car Company is now being handled by the foreign division of the New York office of Maxon, Inc. Frank B. Amos is the account executive on Reo's foreign advertising.

Motor Orders Further Boost Steel's Output

Prospects of Future Automotive Business Encourage Industry

For the eighth consecutive week the steel industry was able this week to increase its operating rate as the result of broader demand from parts makers and motor car manufacturers. The American Iron and Steel Institute's report for the week of 32.7 per cent of ingot capacity in operation denotes a gain of nearly 4 points over the preceding week, no such climb in a single week having been recorded since April of last year.

Finishing mills now have two-fifths to more than one-half of their capacity in operation. All descriptions of steel that enter into automotive consumption have shared in the better demand. In sheets virtually all of the production is for automotive consumption. Although strip mills have somewhat more diversified outlets, takings by parts makers predominate. Cold finished bars have also benefited. Automotive alloy steels show more activity. Bolts are now quoted at a discount of 70-10-10 from the list, the 70-10-10-10 rate, which was quoted by many nut and bolt manufacturers two months ago, having been eliminated.

None of the individual orders coming from parts makers and motor car manufacturers involves unusual tonnages. There is still a disposition to take as many bites of the cherry as possible without impeding operations, but many more buyers are in the market than there were in the fall.

Steel interests are generally optimistic regarding the outlook for further growth of automotive demand in the next few weeks, which attitude is in sharp contrast with their expectations of early improvement in the buying of railroads and structural industries. One hears here and there of this or that buyer delaying postponable commitments until after the inventory period, but on the whole inventory-taking has ceased to be the retarding influence in the steel market that it once was.

Spring Makers Spending \$400,000 for Equipment

Expenditures amounting to about \$400,000 for new equipment, furnaces, etc., have been made recently by major spring manufacturers in connection with production requirements of the new alloy for leaf springs developed by Harold Wills of the Chrysler Corp., and announced on Plymouths last week. The steel known as "Mola" is noted for extremely high tensile strength and even higher resistance to fatigue failure.

It is understood that whereas current high grades of Swedish steels have safe tensile stresses of around 85,000 to 90,000 lbs. per sq. in., the "Mola" alloy is being stressed safely well in excess of 125,000 lbs. per sq. in. on new models produced by this corporation.

The expenditures have been necessitated partly by hardness of the new alloy and partly by necessity for fine uniformity required for good performance. Existing equipment apparently was not adequate—another example where new engineering developments lead to machine tool purchases.

Vesper Opposes Makers Stagger Plan Proposal

F. W. A. Vesper, president of the N.A.D.A. and chairman of the National Control Committee, voiced his opposition to the stagger plan of new model introductions in a statement made this week in Detroit. He pointed out that spreading introductions over the year would also spread the clean-up period similarly, thus maintaining the market in continuous state of turmoil, reducing sales and curtailing employment. Under the uniform announcement plan, on the other hand, Mr. Vesper emphasized, the clean-up was limited to the year-end period.

Pontiac New Car Work Aids Employment Problem

With Pontiac starting production on the 1935 models employment conditions in the Michigan city have materially improved. Already approximately 1000 men have been added to the Pontiac payrolls, bringing the total of active workers employed in the automobile plant to about 2300. At the Fisher Body plant 1000 old workers have been recalled during the last month, bringing the payroll in that factory up to about 1500 employees.

E. G. Budd Co. Financial Reorganization Plan Up

A plan of financial reorganization of the Budd Manufacturing Co. is being discussed by officials of the company and its banking associates, according to reports this week. While Budd executives were not in a position to be quoted upon details of the proposal, it stated that the plan will be presented to stockholders for their approval when the details have been completed.

Republic Appoints Buhl

Buhl Sons Co. of Detroit has been appointed a warehouse distributor for Enduro Stainless Steel, according to an announcement by N. J. Clarke, vice-president in charge of sales for the Republic Steel Corp.

CALENDAR OF COMING EVENTS

SHOWS

New York Automobile Show.....	Jan. 5-12
Los Angeles Automobile Show.....	Jan. 5-13
St. Louis Automobile Show.....	Jan. 6-12
Cincinnati Automobile Show.....	Jan. 6-12
Washington Automotive Assoc., Automobile Show.....	Jan. 12-19, 1935
Toronto, Canada Automobile Show, Jan. 12-19	
Newark, N. J. Automobile Show.....	Jan. 12-19
Buffalo, N. Y. Automobile Show.....	Jan. 12-19
Cleveland Automobile Show.....	Jan. 12-19
Milwaukee Automobile Show.....	Jan. 12-19
Detroit Automobile Show.....	Jan. 12-19
Brooklyn, N. Y. Automobile Show.....	Jan. 14-19
Philadelphia Automobile Trade Assoc. —Automobile Show.....	Jan. 14-19
National Motor Boat Show, New York.....	Jan. 18-26
Toledo Automobile Show.....	Jan. 18-24
Columbus, Ohio Automobile Show.....	Jan. 19-24
San Francisco Automobile Show.....	Jan. 19-26
Baltimore—Automobile Show.....	Jan. 19-26
Boston Automobile Dealers Assoc.—Automobile Show.....	Jan. 19-26
Pittsburgh, Pa. Automobile Show, Jan. 19-26	
Hartford, Conn. Automobile Show.....	Jan. 19-26
Syracuse Automobile Show.....	Jan. 19-26
Nashville, Tenn., Automobile Show, Jan. 20-26	
Rochester Automobile Show.....	Jan. 21-26
Chicago Automobile Show.....	Jan. 26-Feb. 2
Montreal, Que., Automobile Show, Jan. 26-Feb. 2	
Springfield, Mass. Automobile Show, Jan. 28-Feb. 2	
Harrisburg Automobile Show.....	Jan. 30-Feb. 2
Omaha Automobile Show.....	Feb. 3-9

Kansas City, Mo. Automobile Show.....	Feb. 9-16
Denver, Colo. Automobile Show.....	Feb. 10-23
Peoria, Ill., Automobile Show.....	Feb. 13-17
Bethlehem, Pa., Automobile Show, Feb. 18-23	
Evansville, Ind. Automobile Show.....	Feb. 23-27
Minneapolis Automobile Show.....	Mar. 9-16
Mankato, Minn. Automobile Show, Mar. 16-23	

MEETINGS

Automobile Trade Association Managers Midwinter Meeting—New York.....	Jan. 6
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ANNUAL MEETINGS

Society of Automotive Engineers—Annual Banquet—New York.....	Jan. 7
Motorcycle & Allied Trades Assoc., New York City.....	Jan. 9
Overseas Automotive Club Annual Show Luncheon, New York.....	Jan. 10
American Engineering Council, Washington, D. C.....	Jan. 10-12
Society of Automotive Engineers—Annual Meeting—Detroit.....	Jan. 14-18
American Roadbuilders Assoc., Washington, D. C.....	Jan. 22-26
Automotive Parts & Equipment Mfrs., Inc.—Chicago.....	Jan. 29

CONVENTIONS

National Automobile Dealers Assn., Detroit.....	Jan. 14-15
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The Horizons of B

The Goose That Laid — —

THE man who killed the goose that laid the golden eggs had an idea—not a bad idea as ideas go—but he went about its realization in the wrong way. This remarkable goose regularly laid a golden egg which, gold standard or no gold standard, was a valuable periodic performance. Through avidity or necessity the chap who owned the goose wished to realize at once the infinite series of valuable eggs which his goose would lay. There were no organized markets for such geese in those days and the chap being both an economic and biologic illiterate made the crowning error of killing this precious fowl.

Twentieth Century Geese

The modern world is full of geese that lay golden eggs. The man who has a share of stock in a corporation which earns and regularly declares a dividend has such a goose. The man who owns a grocery store which consistently shows a net return after all costs is in the same position. The farmer whose acres and kine at the end of each year show a net income in fact owns a goose that is laying him golden eggs.

It is no crime socially or legally to desire today the present value of all the eggs which these geese are likely to lay. Modern society has so far recognized the legitimacy of this universal desire that it has established markets with extraordinary technical facilities for the realization of this demand. The man who owns the share of

stock which regularly pays a dividend of \$6 a year need not stand by and wait for these golden eggs to accrue through the years.

He may wish the present value of this series of annual accruals either through necessity or because he thinks he can buy another goose which will lay larger eggs. An organized market yields him the free opportunity to get the very thing which the foolish, fabled owner of the goose that laid the golden eggs wanted, namely, the present value of all the golden eggs which the goose is likely to lay. That is precisely what the price of a share of stock is, i. e., the present value of the annual probable dividend payments discounted at the going rate of interest.

Impatient Zeal of Reform

The original owner not able to find or inclined to search for a buyer made the fatal error of killing the goose and got neither golden eggs nor the present value of the probability that such eggs would be laid regularly in the future. There are today many people who in spite of the lesson which the fable points are seriously proposing to kill the goose in order to have all the golden eggs for breakfast in the morning. This is what the reformer demands who assails capitalism on the ground that inequality in incomes persist, that unfulfilled wants prevail.

He sees enormous accumulations of capital. The preliminary

figures on national income for 1933 released by the Bureau of Internal Revenue show that million dollar incomes in 1933 numbered 46 as compared with 20 in 1932. No man can spend a million dollars a year on his personal wants. The excess therefore is added to the existing supply of capital. This exasperates the architects of the millennium. Why cannot, in fact, why should not society leap upon this fettered horde of buying power and distribute it among the needy? They propose to tax it more heavily, to disburse it in higher wages (of which more anon) or to confiscate it. In so doing they are aligning themselves with the fabled owner of a precious asset who wished to anticipate immediately all its future golden dividends. This capital is absolutely necessary to permit the continued material progress of the community.

Dividends of Capitalism

The statistical staff of the Federal Reserve Bank of New York has made a careful study of the rate of capital accumulation since 1820 and the correlative advance in the real wages of the working man. By real wages we mean buying power and not the number of dollars contained in the pay envelope. The study shows that the increased productivity of the workingman is due to the capital which supplements his efforts and makes them more effective. Further that the rate of increase in that productivity and the rate of increase in capital investment in the tools of production are causally related.

If a man cultivates his land with nothing but a hoe the amount of food he can raise is small compared with the amount which he

Business

by Joseph Stagg Lawrence

can produce with the aid of a tractor, a gang plow and a full complement of tractor drawn equipment. As he moves from a crude stick, to the hoe, to the ox drawn wooden plow, the steel plow, the horse drawn sulky plow and finally to the tractor operated gang tools his productivity increases in rough relation to the amount of capital which comes to his assistance.

As a result of the aid which increasing quantities of capital have brought to the worker, his real income in the course of a century has increased approximately 150 per cent. Assuming that the price level remained constant during this century at the 1913 level the pay of the average worker increased from \$6 per week, usually a 78 or 84 hr. week, to \$15 for a 40-hr. week.

Killing the Goose

Capitalism as a form of society has been a goose laying golden eggs. The envious reformer who believes he has the formula for a better society deprecates these eggs and diverts the attention of his audience by pointing to the millions who do not get enough of the yellow fruit. The common trait of all those who agitate for a short cut to perfection is impatience. These are the men who suggest that capitalism be placed on the block, its golden contents extracted and distributed to the needy. Unfortunately the great value of capital is found not in its liquidation but in its ability to promote production. If the wealthy were impoverished through confiscation it would not appreciably alter the immediate condition of the poor. On the other hand it would most certainly halt the progress which has been paying

golden dividends.

Capitalism as an institution cannot be treated in the same manner as a share of stock. There is no known way of anticipating today the higher living standards which it may bring tomorrow. Entirely aside from the reluctance of the social Santa Clauses to use an organized market there is no way in which the future prospects of capitalism can be sold to a bidder. Those prospects capital can make good only through continued freedom to experiment.

Progress Cannot Be Discounted

There is another current application of the fabled folly of the man who slew his goose. One of the brightest eggs which capitalism has laid is the shorter time which the worker must spend at his bench. The machinist a hundred years ago labored a standard day of 13 hr. at a top wage of \$2 a day. That time has been cut gradually but steadily as capital, aided by management, developed new equipment and perfected more efficient organization. During the present century between 1900 and 1929 the working week has been cut 13 per cent. There is no doubt but that further improvement in this direction will take place unless the owner of the goose decides to anticipate all this promised gain on the chopping block. That is the greatest danger of the 30-hr. week. It is such a severe wrench from the normal trend toward shorter hours that it may well defeat its own purpose. Patience, a broader view and the recognition that labor to profit must permit capital and

management to survive are necessary to assure further dividends in leisure to the workingman.

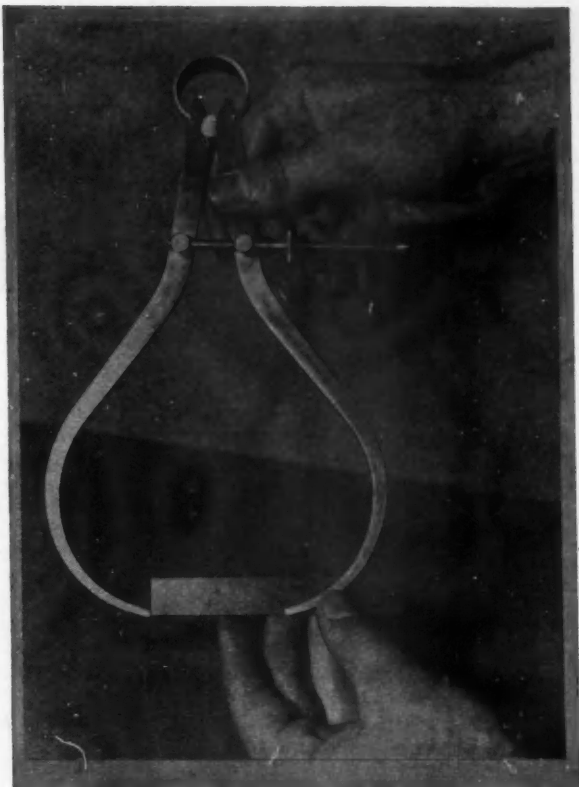
Intelligent Consideration for His Allies

The pace of this improvement depends entirely upon the correlative accumulation of capital and the technological progress which the freedom of that capital will foster. The farmer whose case we may most easily visualize can increase the acres under cultivation and intensify that cultivation only as his tools increase in power and effectiveness. Using capital in the sense in which the average man uses it this farmer's great efficiency as a producer depends first upon the money which he can invest in equipment. Secondly it depends upon the experimentation with better methods, seed and stock which he can carry on and the corresponding experimentation which the manufacturer of equipment can continue.

As the farmer's productivity advances he can either produce more in a given period of time or produce the same amount in a shorter period. It is out of this performance that shorter hours for the worker are forged. Obviously to realize those shorter hours he must exercise patience and treat both capital and management for what they are, namely, his true allies in the march toward a higher standard of living. The counsellors who advise him to extract, by force if necessary, a shorter week than the current status of technological efficiency permits are urging him in fact to repeat the folly of the man who killed the precious goose.

Adopted by Ford

Elimination of conventional common fraction system simplifies work of draftsmen, tool designers, tool makers and inspectors



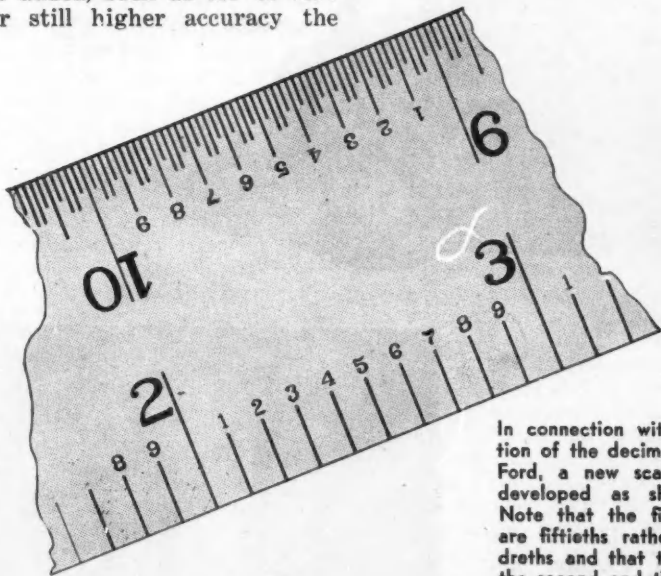
It will be noted that drawings using the Ford system will be less congested with figures and easier to read as shown in the example of a part for the electrical system in a reproduction of a Ford blueprint. This is in large part due to the fact that all dimensions for which a tenth is sufficiently accurate require only one digit as for instance, .6 or .8 inches. Where greater accuracy is required another decimal point is added, such as .10 or 1.90 and for still higher accuracy the

third decimal place, such as .500 or 1.122 as on the drawing. The simplicity of the system in checking dimensions, etc., is shown by the following table. In the first column are given Ford decimals used for dimensioning, in the second column are represented the nearest equivalent fractions, whereas the third column gives the decimal equivalents of these fractions.

Ford Decimal	Common Fraction	Decimal of Existing Common Fraction
.02	1/64	.015625
.03	1/32	.03125
.05	3/64	.046875
.06	1/16	.0625
.08	5/64	.078125
.3	7/32	.28125
.46	15/32	.46875 etc.

It is reported, incidentally, that one or two tap and die manufacturers are already considering the production of such tools to decimal bases and if this were to develop along with decimal standards for drills and reamers, a complete conversion of all dimensioning to the decimal system could be effected. In the meantime all dimensions on Ford drawings are gradually being changed over to the new system of dimensioning.

The comparison in simplicity between the Ford decimal system and for common fractions becomes even more favorable when it is required to determine dimensions through the use of trigonometric functions wherein sines, co-sines, tangents, etc., of angles must be multiplied or divided by other dimensions. If fractionally expressed such dimensions would require complicated multiplications, materially simplified by the fewer number of figures resulting from the use of the Ford decimal system, reducing time required and chances for errors in the calculations.



In connection with the adoption of the decimal system by Ford, a new scale has been developed as shown above. Note that the finer divisions are fiftieths rather than hundredths and that the marks for the second and third fifth are longer than for the first and fourth. Both of these features contribute to easy readability of the scale—better than the fractional scale broken down into 1/64 inches

Preselective Electro-Vacuum Gear-Shift Offered on Hudson-Terraplane 1935

WHAT will probably prove one of the outstanding innovations for the 1935 season is the electro-automatic gear-shift mechanism which is available on all models of the Hudson and Terraplane (though not standard equipment on all). This control mechanism, which eliminates the gearshift lever, comprises a small finger-operated selector unit — called the "electric hand" by Hudson—on the steering column. It is a development of the Bendix Corporation in collaboration with Hudson engineers, and one of its features is that gears can be preselected.

A six-cylinder Hudson has been added to the range of models offered by the Hudson company and the 1935 lines of the company will include the following:

Special Terraplane Sixes, 112-in. wheelbase; Deluxe Terraplane Sixes, 112-in. wheelbase; Hudson Sixes, 116-in. wheelbase; Hudson Standard Eight,

117-in. wheelbase (five models); Hudson Deluxe Eights, 117-in. wheelbase (three models); Hudson Large Eights, 124-in. wheelbase (two models).

Major features of all lines include the following:

Improved appearance, due mainly to new front ends, new rear panels without molding and extended downward, and new molding treatment of side panels.

Metal instead of fabric roofs.

Increased engine power obtained without increase in displacement and reflected by improved performance.

Improvements in the braking system which comprises new shoes, new drums, and a rotary equalizer instead of the usual cross-bar equalizer.

Aluminum-alloy (Lo-Ex) pistons of new design and incorporating an oil-control ring on the skirt.

New water pump of larger capacity and provided with needle bearings.

Hand-brake lever located at the left

under the cowl, to entirely clear the front compartment when the new gear-shift is used.

Starter-switch circuit breaker connected to the clutch, making it impossible to start the engine while the car is in gear—a safety feature.

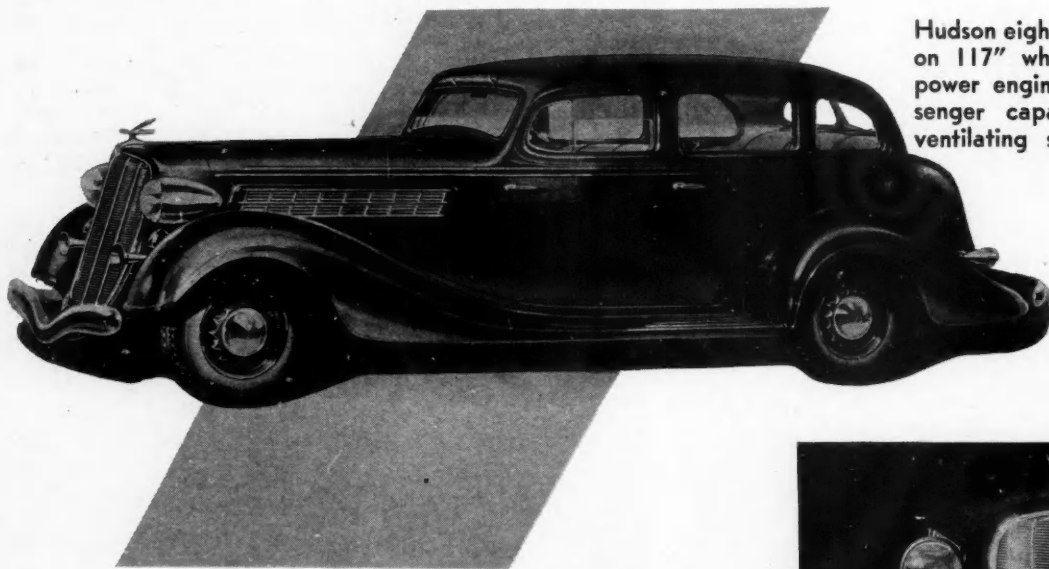
Rear springs more nearly flat and front springs of lower frequency, for lower mounting and a better ride.

Spicer improved direct-acting shock absorbers with removable valves to permit change in riding quality to suit different individuals.

Steel artillery wheels are standard on all models (no option on wire wheels).

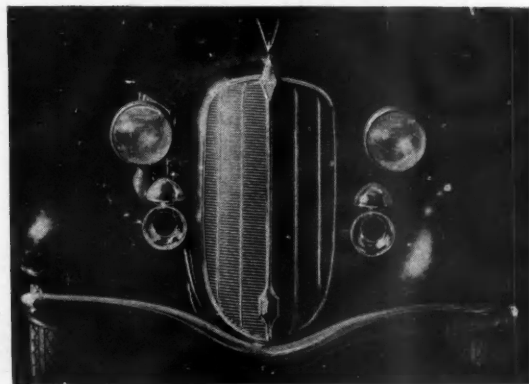
Air-wheel type tires on smaller wheels standard on all models.

Axleflex front axle (which were standard on 1934 cars) are available at extra cost on 1935 models, with the exception of the lowest-priced Terraplane. Cars fitted with this axle are also provided with a torque-bar anti-



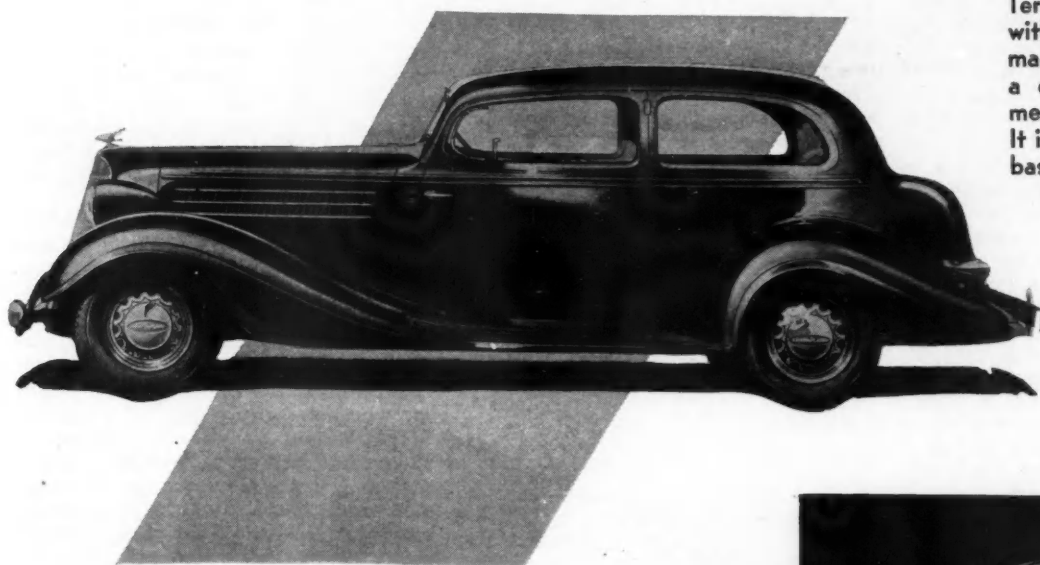
Hudson eight cylinder sedan mounted on 117" wheelbase with 113 horsepower engine. This is a full six-passenger capacity car with modern ventilating system and welded all-steel roof.

Front view of the 1935 Hudson car showing the new radiator grill and the lower, deeper, narrower effect of the new model



Gear Shifter 1935 Models

by Athel F. Denham
Detroit Editor, Automotive Industries



Terraplane six cylinder Coach with trunk. This car is also made without the trunk with a concealed rear compartment for tire and baggage. It is mounted on 112" wheelbase and has an 88 horsepower engine

roll device at the rear end, designed to reduce side sway and body roll.

Front seats 3 in. and rear seats 2 in. wider.

More leg room in rear compartment, due to recessing of backs of front seats.

The new cars have narrower and deeper radiator grilles, located well ahead of the front axle. The deeper radiator shell adds to the impression of length of hood and of size of cars generally. Hood length is further emphasized by the horizontal louvre treatment.

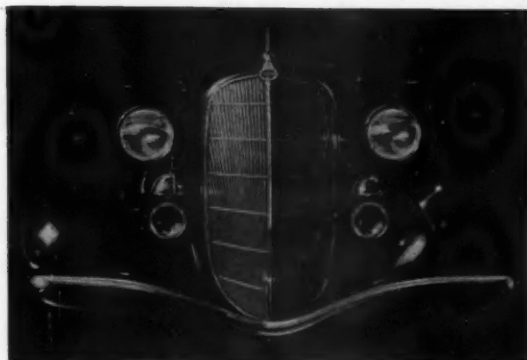
Lamps are bullet-shaped and longer. Moldings terminate at the rear-quarter panels. Trunks on models carrying built-in types are materially larger.

Last-year's ventilating system is continued, except on the standard Terraplane, which now has a front window that first rises and then slides horizontally when operated by a single crank regulator.

The largest Hudson — of 124-in. wheelbase — will be a completely-equipped car, with such items as radio, double outside air horns, the new gear-shift mechanism, etc., included in the standard equipment.

Owing to the use of smaller wheels and rear springs that are more nearly flat, the cars are 1½ in. lower than last year. Rear windows are divided by a central metal strip, for the sake of improved appearance.

New radiator grill used on the Terraplane Six for 1935. The car is narrower and lower at the front with a longer hood. Streamlined lamps and other accessories increase the effect of length



The all-metal roof is a part of the body structure, being spot-welded in place, and adds to the strength and rigidity of the body. There are rubber seals between the metal roof and the side, front and rear panels. Top bows are retained and any drumming tendency is restrained by padding between the top bows and the roof.

Turning now to the mechanical improvements, there is first of all the new gearshift mechanism. Shifting of the gears is effected by means of two vacuum-operated cylinders—one to replace the fore-and-aft motion of the conventional shift lever, the other to replace its lateral motion. These cylinders are controlled by a group of three valves operated by electric solenoids or magnets, which latter are energized first by the selector switch placed on the steering column and then by auxiliary switches which are completely automatic in action.

The shift mechanism can be used

with an automatic clutch or without it. Where there is an automatic clutch, the shift is effected by momentarily releasing the accelerator pedal. Without an automatic clutch the shift takes place when the clutch pedal is depressed by the foot. Gears can be selected at any time, and nothing happens until the clutch is disengaged—which is accomplished by pressing down on the clutch pedal where the clutch is controlled directly, and by releasing the accelerator pedal where the clutch is automatic.

The transmission itself is essentially the same as last year, except that the teeth are chamfered to a larger angle, for easier meshing and to permit greater latitude as regards speed at which the shift is made; and, of course, the new shift linkage is added. Further details of this mechanism are given on the following pages of this article.

As may be seen from the illustration of the new rotary brake equalizer, it is pivoted at the center, and cables from

one side of it extend to the rear brakes, and from the other side to the front brakes, the lever-arm length of both sides being the same. The brake pedal and brake hand lever are connected to opposite sides of this equalizer. The thickness of the section of the brake drum has been increased 20 per cent, for greater rigidity; on the other hand, the brake shoes have been made more flexible, with the object of ensuring greater conformity between shoe and drum.

Output ratings of all engines have been increased. The Terraplane engine, with a compression ratio of 6.0, is now rated at 88 hp. at 3800 r.p.m., and the Hudson Six engine, of the same displacement but a compression ratio of 6.25, at 93 hp. at 3800 r.p.m. The rating of the Hudson Eight engine, with a compression ratio of 6.0, is now 113 hp. at 3800 r.p.m. Composite aluminum-iron cylinder heads, giving a compression ratio of 7.0, are available as extra equipment and increase the output of the Sixes to 100 hp. at 3800 r.p.m. and of the Eights to 124 hp. at 4000 r.p.m. Hudson sedans of 117-in. wheelbase, when fitted with the high-compression engine, have a weight power ratio of 25 lb. per hp., based on

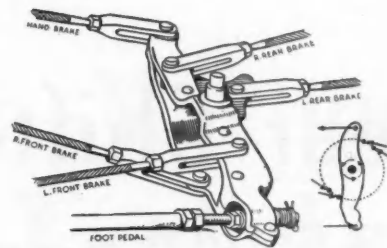
the weight of the car ready for the road.

The increase in engine power was accomplished mainly by improving the breathing characteristics. Clearance around the intake valves was increased, manifolds were made larger in diameter, and the cam followers were provided with a radius of 3 in. instead of 1½ in., which increases the area of the valve-lift diagram.

The new pistons are interesting. At the top there is a very wide land and all rings are moved further down, the lowest oil ring being located below the piston pin, which is unusual in aluminum-alloy pistons. These pistons are of the solid-skirt type and the design is said to be such as materially to reduce oil consumption, particularly at high speeds. The two compression rings are 3/32 in. wide each, while the oil rings are 3/16 in. wide.

The foregoing are the major engine changes, aside from the increase in the capacity of the water pump and the provision of needle bearings on its shaft, which reduces the need for lubrication attention. Clutches, propeller shafts and axles remain unchanged.

The torque-bar stabilizer, which is available with Axleflex suspension, as



Rotary equalizer used on Hudson and Terraplane brakes for 1935 providing exact proportion of braking effort on all four wheels

standard equipment on Hudsons and at extra cost on Terraplanes, in addition to reducing body roll, reduces tire squeal on curves.

In the steering mechanism the length of the pitman arm has been reduced from 6 to 5¼ in., to increase road clearance and improve the "road feel."

Tires are now 6.00 in. in width on the Terraplane and Hudson Six, 6.25 in. on the Hudson Standard and Deluxe Eights, and 6.50 in. on the 124-in. wheelbase Hudsons.

Instrument panels are similar to those used last year, having ivory dial plates. Deluxe Terraplanes have outside dual horns, dual tail lamps, a larger (15½-gal.) fuel tank, thermostatic control of water and manifold temperatures, and an automatic choke. These items are not on the standard models.

Because of the steel roof, radio antennae are now of the tubular type and mounted under the running board, and the output of the Zenith radio receivers has been increased to compensate for the reduced antennae pick-up. Loud speakers are now separate and mounted on the dash.

Oil level gages are no longer standard equipment.

* * *

Referring to the accompanying illustration, it will be noted that the Hudson-Bendix shift control mechanism is composed of the following major units:

1. A conventional transmission to which have been added first, an actuating shaft *E* attached to the lower end of the conventional shifter arm *A*, and replacing the normal gear shift lever which has been removed from the top of *A*; and, second, a sliding link *D* attached to the lower end of *A* in such a manner that forward and backward movement of *A* result in similar movements of the link. This link operates one of the two automatic switches of the assembly.

2. A shift cylinder, vacuum-operated and connected to *E* through a bell-crank *G* to effect forward and backward movements of shifter *A* by rotating shaft *E*.

3. A shift diaphragm *Y*, to which is connected bell-crank *F*, rotation of which moves shaft *E* in and out, trans-

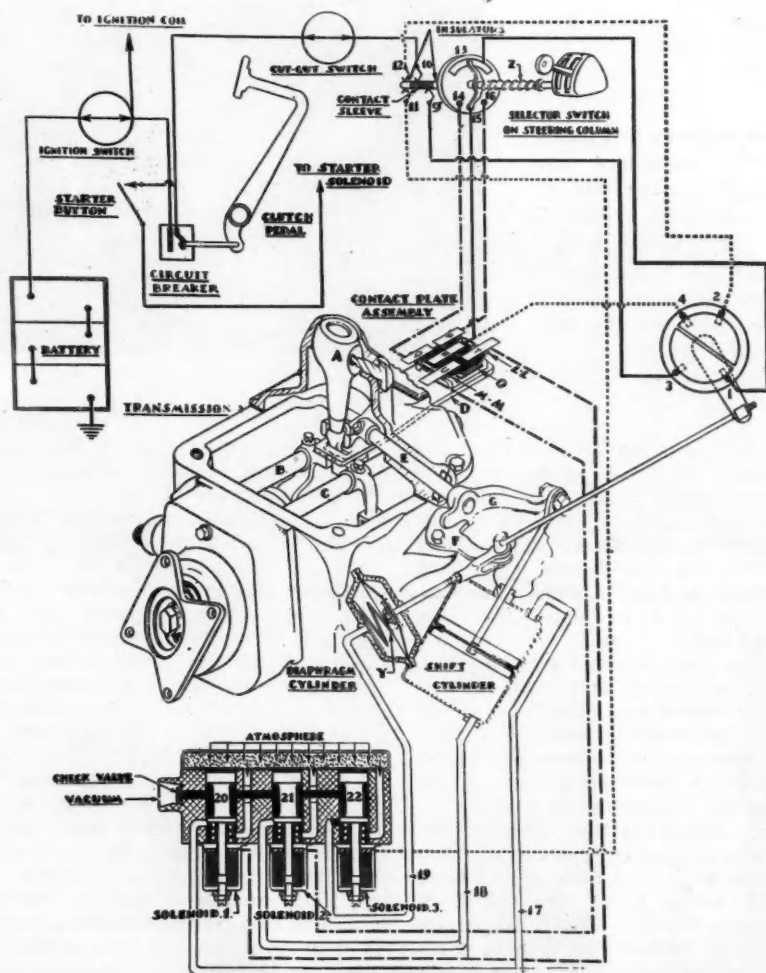
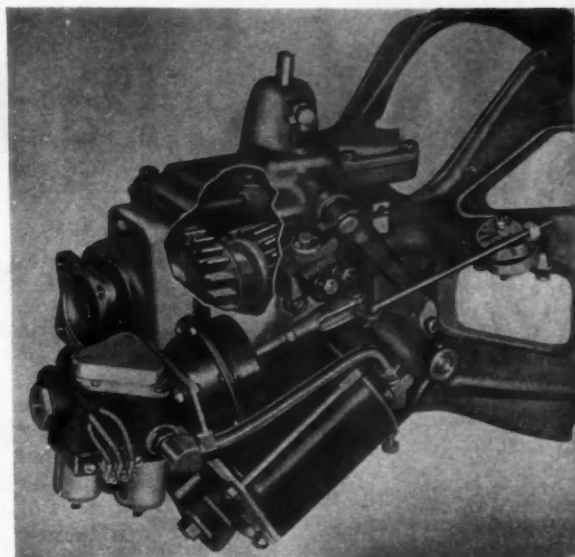


Diagram of Hudson-Bendix power shift available on the 1935 line

Synchro-speed transmission with alloy steel gears specially improved with a new chamfer on the gear teeth for silent shifting. Note the vacuum shifting device which is optional for 1935



New windshield control used on Hudsons and Terraplanes for 1935. Turning the crank controls the degree of windshield opening.



versely, and therefore moves shifter A similarly. According to the position of this diaphragm, the main shift cylinder previously mentioned actuates either shifter rod B or shifter rod C in the transmission.

4. Connected to the shift diaphragm through a rod is a second automatic "interlock switch," which has only two positions, but has a series of contacts wired to other switches, and the actual selection of the circuit established under each different condition depends on the positioning of the other switches.

5. Both shift cylinders are actuated by admitting vacuum or the atmosphere, by means of three control solenoids, as shown. Of these, solenoid No. 1 determines whether the upper end of the longitudinal-shift cylinder is open to vacuum or atmosphere; solenoid No. 2 performs the same function for the lower end of the same cylinder; and solenoid No. 3 controls the admission of vacuum to the rear side of the diaphragm unit controlling the transverse shift.

Each solenoid valve is supplied with a return spring, so that when there is no current through that particular solenoid, the valve is raised, and the line to the cylinder it controls is open to atmosphere. It will be noted that while only one line connects to the diaphragm—return being effected by the return spring—the piston in the other shift cylinder is not spring-loaded. Thus this piston can be "balanced" in any position by simply opening both ends of the cylinder to atmosphere, after the shift has been completed. This is done automatically by breaking the circuits to the solenoids Nos. 1 and 2 through the automatic contact-plate switch first mentioned, as the shift is completed.

6. Mounted on the steering column is the selector in the form of an H-gate

switch. The finger lever of the mechanism is connected to a spring-loaded shaft. When the finger lever is moved across the gate of the H, a contact sleeve on this shaft determines whether the primary circuit established should go through lead 9 or lead 12 to the interlock switch. Normally the spring locates the finger lever to the right, ready to engage either second or high. When moved to the left to engage either first or reverse, another contact (12) is also established by the contact sleeve, which serves to energize solenoid 3.

7. It should be remembered, however, that positioning of the selector switch does not necessarily start the operation. To make its operation pre-selective, the main circuit to the shifter mechanism is provided with a circuit breaker operated by the clutch linkage, so that no current passes through the mechanism unless the clutch is disengaged. A cut-out switch is provided on the steering column to make the mechanism inoperative.

There is also a safety circuit breaker for the starter motor solenoid, hooked to the clutch linkage, so that the starter

motor is inoperative unless the clutch is depressed.

Before discussing the operation of the shift, reference should again be made to the first-mentioned automatic switch operated through a link from shifter A. Carried on this link is a sliding block O carrying two sets of "finger contacts" LL and MM. They serve to interconnect the five contact plates shown in various manners, according to the position of the link controlled by A.

Of these plates, T and U are connected to solenoids 1 and 2 respectively. The other three are connected respectively to the contacts in the selector switch corresponding to forward, central, or rear positioning of the finger lever (see contacts 14, 15 and 16 in the selector switch).

It will be noted that plates P and Q are shorter than plates T and U respectively, so that when the link D slides to its extreme position, when completing a shift in either direction, the contact fingers slide off these shorter plates, thereby breaking the circuit to the solenoid which has been actuated.

New Viscosity Standards

THE Committee on Viscosity Standards of the American Petroleum Institute has selected four tubes out of nine for Saybolt Universal viscometers as being most nearly duplicates. After a further exhaustive comparison of these four tubes in a new standardization bath, with each other and with the present questionable master standard tube and bath

one will be chosen as the new U. S. master standard for Saybolt Universal tubes. This will be set aside at the Bureau of Standards and used only once a year for checking purposes against the three secondary standards. One of these is to be retained by the chairman of the Committee and used only for annual comparisons with the master tube, and the other two tubes are to be used at the Bureau as standards.

How Packard Developed Its New

by Athel F. Denham

Detroit Editor,
Automotive Industries

WHEN the Packard Motor Car Company decided to carry out a long considered plan of entering the lower-priced field by bringing out an entirely new car, yet to be announced, it was faced with one of the biggest problems in its history. Although individual Packard engineers in the past, with other companies, had had experience with the designs of smaller or lower cost cars, that certainly wasn't true of the Packard organization as a whole.

Engineering, costing, production and sales departments were geared

to the design, manufacture and sale of higher priced automobiles. It might have been possible for the various divisions to adapt themselves to the new problems involved, but the chances were against successful overnight adaptability. The problem on the other hand was immediate. Packard decided to take no chances.

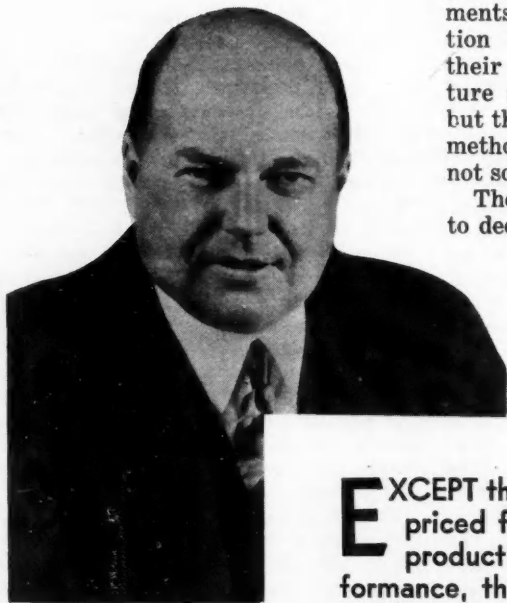
Some of the steps, which thereupon were taken have already been publicized, to some extent. Announcements have been made of the acquisition of many men recognized for their ability in the design, manufacture and sale of lower priced cars, but the ideas behind these moves, the methods which they followed have not so far been publicized.

The first step in the process was to decide what kind of car should be

built, at what market it should be aimed, etc. A survey of the field indicated to Packard executives the desirability of building a quality car for a certain lower-priced field. This determined roughly the major specifications of wheelbase, maximum weight and maximum cost.

Except for the additional general provisions that the car should equal or excel possible competition in the way of appearance, comfort, and performance, that it should be a quality product and have a high durability value, the executive staff set no further specifications. Not even the type of engine to be used was specified. All details were left to the knowledge and ingenuity of men who knew better the possibilities and the limitations of individual design details for a car aimed at this new field.

On March first, Earl H. Smith joined the organization. He came to Packard from the Pontiac Motor Car Company where, as assistant chief engineer, he had been prominent in the design of the 1933 Pontiac eight. Previously he had had a large part



M. M. Gilman,
vice president
Packard Motor
Car Co.

EXCEPT that a car was desired to sell in a certain lower-priced field, and that it should be a durable, quality product competitive in appearance, comfort and performance, the Packard engineering staff was given practically a free rein in developing the new car shortly to make its public debut.

The accompanying article tells how the engineers handled the job—and in many respects their procedure represents a new high in efficiency for new car development programs. In actual design, before any part was approved, it had to run the gauntlet first of an expert cost department, thus avoiding later trouble commonly arising where production considerations do not figure in early design stages, and second an "outside contact" department which checked continuously with machine tool builders, parts makers and material suppliers. Although these precautions obviously simplified things for Packard's production department, it was not relieved of responsibility for recommending further revisions.

ts New Lower-Priced Car

Program featured by careful initial planning plus continuous coordination of engineering and manufacturing throughout the creation of the design

in the successful development of the Oldsmobile "F" series.

On Earl Smith developed the job of building an organization and developing a method for bringing the new car into being. As the detail design of this completely new automobile progressed it had to be known at all times whether or not each detail was meeting the requisites as to cost. This was particularly important since performance, durability and quality were first considerations in design.

Perhaps the best method of describing the methods by which this was accomplished is to follow the actual set-up. First of all there was the original design department. This was headed by Earl Smith, assisted primarily by Erwin L. Bare (formerly of Hupp) in charge of bodies, and E. A. Weiss, who came to Packard from Willys in charge of chassis. Before beginning actual detail design an experimental cost set-up was worked out. The desired maximum cost, including all charges, such as overhead, tooling, etc., was estimated for each part. This was the primary yardstick. It told, not what each part would cost, but approximately what its maximum cost should be, to be in line with the final cost of the complete automobile.

Alvan Macauley, president of Packard Motor Car Co.



Then the actual design work began. The first design of each part obviously was experimental in character. Before it could be okayed, even on a cost basis it had to run the gauntlet of two separate non-related departments. First it went to the cost division under E. H. Johnson, a well-known cost engineer, formerly with Pontiac. This department worked much as does a factory costing division. Its job was not to consider the engineering function of the parts in question but to consider the cost of production. It was made up primarily of seven men, these being, in addition to Mr. Johnson, a machine shop specialist, sheet metal specialist, a body man, a trim expert, a statistician for collecting and checking data, and a weight specialist.

From here the part went back to development engineering, sometimes with approval, sometimes with recommendation of changes to bring cost in line. If the cost was too high, the engineering department knew it before the part had been okayed by engineering, before it had been tooled, or completely detailed.

The real work started here. Man-

ufacturing problems entered into engineering design. In most factories the procedure of bringing a new car into being works roughly as follows: Although the production division "sits in" to some extent on engineering design, it does not have primary control over design, and in the case of most parts does not see them until after the engineering department has okayed them in detail. Then it is up to production to tool that part. If it desires changes to make production processes simpler, or to enable the use of machine tools already available, or to reduce costs, it is on the defensive. Sometimes compromises are arrived at under these conditions which are satisfactory to neither engineering nor production departments. Sometimes production is forced to accept engineering design; sometimes engineering must unwillingly concede changes to production.

Often the production division could make excellent recommendations of design changes but incorporation of these changes proves impracticable on account of lateness and the fact that other parts would also be influenced by the changes. Furthermore the conventional method

of costing by the production department from blue-prints would have been much too slow, with intervals of waiting. Packard circumvented the possibility of such later strife by bringing production considerations into the EARLY DESIGN STAGES. In addition to the departments mentioned, which contributed vastly toward that end, another department was functioning: an "outside contact" division in the new engineering set-up under Chas. N. Lejuste, formerly Olds purchasing agent. Working closely with the internal cost division under Mr. Johnson, this department had the responsibility of checking with machine tool manufacturers, with parts vendors and with materials suppliers.

In effect it represented the first time that outside contacts were on a large scale related to initial engineering design. This division was more than a mere contact department. It was the personification of the principle first of all, that machine tools are not products in themselves, but rather are means to an end, and as such entered significantly into creative design. Next, it served as a definite recognition of the engineering ability of parts manufacturers to contribute to engineering design before the final layouts had been reached.

Furthermore it served as a definite check for Packard on production costs against outsiders. If outsiders could build the part cheaper than Packard and if so, why.

All this did not mean that the factory production department was relieved of all control and responsibility. It did simplify the job for this department, later, however. By including costing in design in its initial stages, engineering could go to production and say: "Here are the parts. Here are the costs for which we know they can be built and the tooling and expenditure required for production. If you can suggest methods which would reduce costs still lower all the better."

Thus detail design for the new Packard was going through three stages:

1. Initial design based on an estimated maximum cost, and to satisfy quality requirements.
2. First studies on cost; design revisions; further cost studies based on both internal conditions and outside contacts; gathering of alternative machine tool set-up suggestions from various groups of machine tool manufacturers; together with parts company recommendations, and perhaps further changes.
3. Finally factory production de-

partment study and possible revision.

With all these stages to go through it would indeed be surprising if the various parts for the new Packard "X" car are not produced in the most modern manner for lowest cost considerations.

Unfortunately we are not permitted at this time to show in detail how the various departments interlocked cooperatively on this project; it would tell too much of the actual car design. However, without divulging any significant details, a few examples can be cited here of the effectiveness of this method of operation.

There is the case of an oil pump boss. The face of this boss had to be perpendicular to the hole to obtain for one thing correct relationing of gear centers. It looked like a difficult part to produce. It was costed finally in line with the desired maximum. But the outside contact department wasn't satisfied. It put the problem up to some machine tool manufacturers, and out of this there developed a process for milling the face while maintaining true perpendicular relationship. It saved two to three cents per car—for just that little item.

There was another instance. In the engine the original layout called for milling the faces of the bearing caps, drilling holes, spot facing, etc., in the conventional manner. Machine tool manufacturers were called in and with only a slight change in design, perfectly satisfactory to engineering, made it possible to finish the caps by simply external broaching the faces, etc., and finishing the bolt holes on

multiple spindle drills. A study of comparative costs proved the set-up worth while. It produced a saving of more than 18 cents per piece which amply justified the purchase of new machine tools to do the job.

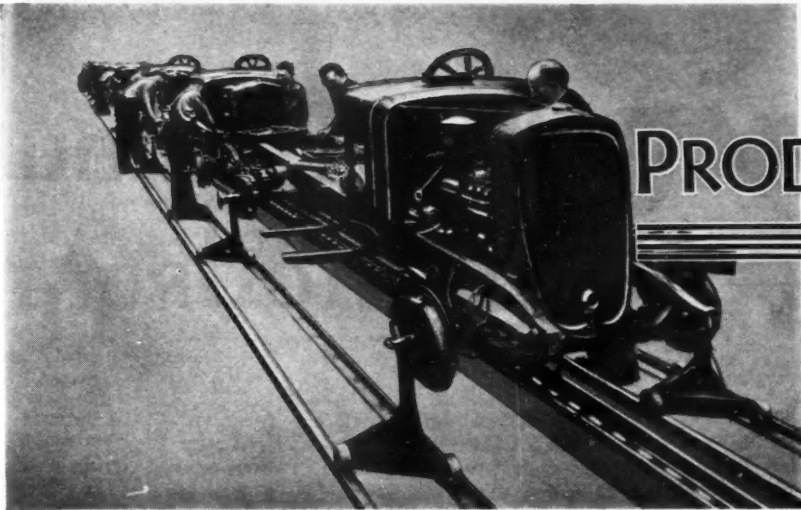
There are dozens of similar items which can be cited. There is that of the cylinder block, for the production set-up of which the various machine tool manufacturers bid in competition. The machine tool producers who got the contract didn't enter the lowest bid. They were higher than most. But they showed a production saving of one dollar per piece, and the tools retained sufficient flexibility for future change-over so that the added capital investment was well worthwhile.

Then there was the instance of a part originally designed to be made up out of forgings and bar stock. A parts manufacturer called in on the design in its early stages suggested a change to stampings and tubular stock, welded together. Comparison showed that the suggested part was not only vastly cheaper to produce, but just as strong and just as satisfactory, and yet lighter. Design hadn't progressed so far that other necessary changes couldn't be made to accommodate the new design.

And so the story goes. The new set-up in the Packard engineering department, under the direction of Col. J. G. Vincent, vice-president in charge of engineering and Clyde R. Paton, chief engineer, has been providing moreover an education to the entire engineering department which should prove invaluable on future design work for Packard cars.

New Studebaker Prices

Dictator	1935	1934	Change	Commander	1935	1934	Change
Coupe, 2-p.	\$695	\$695	....	Roadster, Regal....	980	945	+ 35
Coupe, Regal, 2-p..	730	730	....	St. Regis Sedan,			
Coupe, 4-p.	750	750	....	Custom	955	920	+ 35
Coupe, Regal, 4-p..	780	780	....	St. Regis Sedan,			
Roadster	750	...	....	Regal	970	935	+ 35
Roadster, Regal....	780	...	....	Sedan, Custom	985	950	+ 35
St. Regis Sedan....	720	720	....	Sedan, Regal	1,000	965	+ 35
St. Regis Sedan,				Land Cruiser	1,085	1,135	- 50
Custom	755	755	....	Land Cruiser, Regal	1,100	1,135	- 35
St. Regis Sedan,							
Regal	770	770	....	President			
Sedan	750	750	....	Coupe, 2-p.	1,245	1,170	+ 75
Sedan, Custom	785	785	....	Coupe, Regal, 2-p..	1,275	1,200	+ 75
Sedan, Regal	800	800	....	Coupe, 4-p.	1,295	1,220	+ 75
Land Cruiser	885	...	....	Coupe, Regal, 4-p..	1,325	1,250	+ 75
Land Cruiser, Regal	900	...	....	Roadster	1,295	1,220	+ 75
Commander				Roadster, Regal ...	1,325	1,250	+ 75
Coupe, 2-p.	895	865	+\$30	Sedan, Custom	1,330	1,255	+ 75
Coupe, Regal, 2-p..	930	895	+ 35	Sedan, Regal	1,345	1,270	+ 75
Coupe, 4-p.	950	915	+ 35	Land Cruiser	1,430	1,445	- 15
Coupe, Regal, 4-p..	980	945	+ 35	Land Cruiser, Regal	1,445	1,445	None
Roadster	950	915	+ 35	Berline, Custom ...	1,430	1,405	+ 25
				Berline, Regal	1,445	1,420	+ 25



PRODUCTION LINES

More Defined

Talking to Art Herrington the other day we found he has a knotty problem. It concerns the matter of technical vocabulary when dealing with foreign customers. Art builds a lot of motorized equipment for Persia where automobile terms have no equivalent in the native language and it's therefore most difficult to transact business by correspondence. So new Persian words are being coined and an Anglo-Persian technical dictionary is now in the throes of evolution. These fellows believe that a straight line is the shortest distance between two points.

Silent Gears

Recently we had the experience of going through the Formica plant and seeing first hand how molded timing gears are produced. We can assure you that it's most instructive to have a look at the steps in the process. One detail in particular was really impressive—the heat treatment of finished gears. It seems that all such gears must be given a normalizing treatment, in much the same way as alloy steels, to assure a stable structure. It takes a peep behind the scenes to appreciate the reason why the fabric gear is worth what you pay for it.

Supercharging

One of the most active builders of heavy duty motorized equipment told us several days ago that the next development in heavy-duty truck engines would be supercharging. He feels that in the near future power plants of grater horse power but smaller size and weight will be de-

manded. This would require supercharging. It seems that British designers have done some work along this line and at least one passenger car job has succeeded in supplying a pressure of 30 lb. with a Zoller-type supercharger.

Carbide Handbook

In response to the demand for up-to-date information, the makers of Widia cemented carbides have just issued a combination handbook and catalog describing the manufacture of Widia, application, grinding, tool forms, etc. A number of illustrations are included to show some of the more recent applications. Copies of this valuable handbook are free to those interested.

Ram Turrets

J & L, makers of the new ram type universal turret lathes have published a catalog completely describing the new line. The book gives specifications, application data, and other pertinent information. You men in the production department will want a copy for your shop files.

Romance of Iron

Republic Steel is ready to distribute the Fifth Edition of "Sheet Iron—A Primer" running 64 pages of text and illustration. Here is a little book replete with details of the production of sheet iron, tracing it from the ore to the final inspection of the sheet. It unfolds a veritable romance of the steel industry with some of the background that must be unfamiliar to many people. Ostensibly written for technical school students, it should be of inter-

est to everyone, although you may want to read it surreptitiously if you are an expert. When asking for your copy—say Bulletin 127.

We Lead

Last year, the most important consumers of steel were the automobile, container, building and railroad equipment industries, in the order named. This group used 53 per cent of all the finished steel produced. The automotive industry alone took 21 per cent. In order to meet the vast range of demands for its products, the steel industry has a plant investment of \$4,848,010,935.—From *Steel Facts* for November.

Olympia Show

Our friend R. S. Drysdale, manager of the cutting oil division of Sun Oil, has just returned from a visit to England which was timed with the machine tool exhibition at Olympia. It was truly an international exhibition on a grander scale than any thing seen here. We understand that visitors were treated to the spectacle of over 1000 machine tools in actual operation. In fact one large English machine tool builder had 90 machines in action in his own booth. With this perspective we can look forward to our own machine tool exposition which has been scheduled for the fall of 1935. All the world will be amazed at some of the machine tools now in the making that will be shown in Cleveland for the first time about a year from now.—J. G.



ASME Annual Meeting Methods Are A

PERHAPS one of the most important developments arising from the 1934 Annual Meeting of the American Society of Mechanical Engineers was the formation of a sub-committee on quality control functioning through the management division of the Society. While the three formal papers presented by this group in themselves are most important, the real significance of the quality control group lies in the practical possibility of acquainting management as well as the engineering profession with a new tool—statistical control.

Within the limited time at our disposal, we propose to set down a few of the high spots of this session as well as those of two machine shop practice division meetings which produced some brilliant papers and discussion.

Two of the papers presented at the quality control session are published in full in the December issue of *Mechanical Engineering* — "Control of Distribution" by Theodore H. Brown, professor of business statistics, Harvard University, and "Some Aspects of Quality Control" by Dr. W. A. Shewhart of the Bell Telephone Lab.; the third, "Theory of Probability Applied to Time Study Methods" by W. R. Wright is unpublished.

Dr. Shewhart continued his exposi-

tion of quality control by the statistical method as one of the greatest influences in producing better quality in manufactured products, at lower cost. In manufacturing, quality control can be applied at least three points—in specifying raw materials, in setting production tolerances, and in setting criteria for the final inspection. Each type of specification is different and must be designed to fit the needs of the operation.

If management has any question as to the desirability of fitting statistical control into its scheme of operations, it need only consider the advantages that accrue from quality control as stated by Dr. Shewhart:

1. Reduction of inspection cost;
2. Reduction in the percentage of defective product;
3. Ability to anticipate trouble on long run, repetitive operations, through the use of control charts;
4. Possibility of improving manufacturing tolerances without additional cost.

Thus far, the telephone industries are the only large-scale operations using statistical control. But their experience has been so remarkable that it would pay any progressive manufacturer to investigate the possibilities of the method. Current literature will provide any one interested with the necessary tools.

In discussion, one of the Western Electric inspectors pointed out that in his organization, statistical method has been invaluable in getting at the causes for variability in quality. That is to say, one of the by-products of quality control is the spirit of investigation which enables the organization to put their fingers on the weak spots in the production set-up and when these are eliminated, to get better quality without added cost. In setting up quality standards at Western Electric, the production department is called into conference with the quality control division and the group sets up a bogey

at which the foreman of the department is to aim.

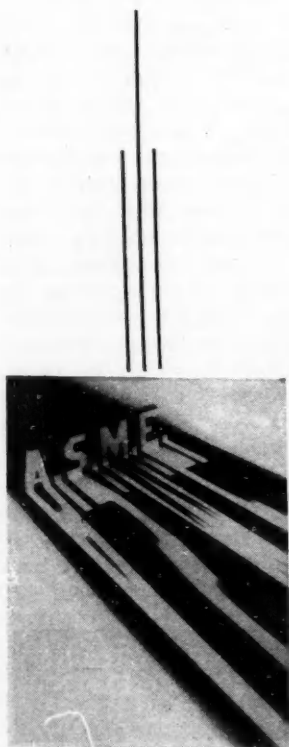
Professor Brown opened a new field of investigation with the aid of statistical methods—the field of merchandizing and market analysis. How accurate are estimates of the market for any product? Since all studies are subject to variation, what adjustment must be made in the figures submitted by an investigator in an advertising or merchandizing analysis?

The point is that the statistical approach is a more scientific and a more accurate manner of analysis. It provides a better picture of the relationship of various elements of the problem; it gives a better approach to the sampling of a market; it offers a means of estimating the probable error of the final results, thus giving the sales executive more confidence in the study. In Prof. Brown's contacts with merchandizers he has yet to find an organization that is using the statistical analysis based on probabilities, in current practice. Here indeed is a signal opportunity for progressive organizations.

W. R. Wright in his paper brought out an interesting application of the theory of probability to time study. He was faced with the problem of saving time and increasing the accuracy of time studies of multiple spindle operations in the textile industry where one operator is required to tend four, five or six machines. The chief difficulty was the matter of estimating interferences or down time of one or more spindles during the time that the operator is working on a given spindle. Previously the estimates were based on lengthy time studies running for hours and these studies had to be duplicated for each new job.

By applying some formulas developed by Fry in telephone work, Mr. Wright was able to work out a series of charts covering the combinations of spindles used in his operation. These charts were checked by a time study running 1100 hours with surprisingly close correlation. These charts have replaced detailed time studies and the standards are used not only to cover any assignment for multiple spindle machines but also to determine the maximum economic number of spindles per operator based on the lowest total cost.

Obviously it is impossible here to



Meeting Hears How Statistical Applied in Controlling Quality

Factors affecting formation of built-up edge covered in report of research in metal cutting

by Joseph Geschelin

Engineering Editor, Automotive Industries

give any of the details of the new statistical control. However we shall be glad to refer those interested to the literature on the subject.

One of the most important studies in the field of metal cutting was contributed by Hans Ernst of the Cincinnati Milling Machine Co., in a paper "Metal Cutting: The Formation of the Built-Up Edge" which was written jointly with M. Martellotti of the same company.

The paper is still unpublished but it should be of greatest interest to all who are concerned with metal cutting of any kind. The authors show by means of a series of careful tests that the so-called "built-up" edge over the point of the cutting tool exists under all conditions to a degree which may be varied as desired by variations in certain controlling factors. The demonstration was carried on in a milling machine cutting different types of metals. The modus operandi was to focus a microscope on the region at the cutting edge, and in turn take motion pictures of events through the microscope eyepiece.

It is an outstanding and masterly piece of research and one which should reflect great credit not only upon the authors but also the organization with which they are associated. The authors find that the built-up edge may be controlled and decreased by the following factors:

1. Decrease in chip thickness;
2. Increase in rake angle of the tool;
3. Increase in tool sharpness;
4. Application of lubricant to the tool face;
5. Increase in cutting speed.

In heavy roughing cuts the built-up edge serves to protect the tool and increase its life, but this is done at the expense of surface finish. For any given job a compromise must be made in the cutting conditions, depending upon whether tool life or surface finish is the important factor.

The paper is offered as a preliminary study in a virgin field of endeavor. Future work along this line is expected to produce a mathematical theory of metal cutting which could be brought to bear on any practical problem. Some time in the near future we expect to publish a more lengthy abstract of this important paper with a few of the photographs which show the metal cutting process so beautifully.

R. C. Deale, secretary of the ASME sub-committee on metal cutting data presented a progress report to the effect that a great amount of preliminary data on cutting tools and performance had been collected and that the committee was prepared to proceed with the development of a handbook on the subject. The project in its final analysis is to publish a series of four handbooks on metal cutting which will provide tabular and other material giving recommended tool forms, speeds, feeds, depth of cut, etc., for the various metal cutting operations in current practice. The handbook mentioned here is the first of this series and should be available some time soon.

Prof. O. W. Boston and W. W. Gilbert of the University of Michigan presented a paper, "Relation Between Cutting Force, Temperature, and Tool Life When Cutting Steel with a Single-Point Tool." This paper covers an in-

vestigation in which the three components of the cutting force are correlated with the relative cutting speed for a specific tool life and the cutting temperature as determined by the tool-work thermocouple method. The relation between the cutting forces and resulting temperatures developed is shown as the tool wears throughout its tool life when cutting a brittle and ductile steel under specific conditions of cut.

The cutting temperature and three components of the cutting force are shown as a function of cutting speed for each of numerous newly ground tool shapes in which such elements as nose radius, side-cutting angle, side-rake angle, and back-rake angle are systematically varied.

The broaching section was devoted entirely, except for the presentation of a report by R. E. W. Harrison, on "Progress in Machine Shop Practice," to the paper by the author, entitled "Current Practice in Surface Broaching."

This paper, which is published in its entirety in the *Transactions of The American Society of Mechanical Engineers* for November, 1934, covers the development of surface broaching as a primary mass production process. Many examples are given of applications in the automotive field and the new surface broaching machinery and tooling now on the market are briefly described.

Discussion, which was particularly lively, brought out the fact that cemented carbide tool tips are being applied to some new broaching applications now in process. This is unusually significant and the details of these broaches will be of great interest when they are released.

Another matter that was thrashed out in discussion was the possibility of adapting surface broaching to lot production rather than operations on single long run set-ups. Although little experience is available it was pointed out by S. Einstein and several factory executives that the method could be applied to similar parts which might be of the same length but of different width; or of approximately the same length but of different width. Further study along this line should be invaluable in expanding the application of surface broaching.

Use of Radial Engines in C

by Capt. Thomas H. Nixon
United States Army

COMBAT vehicles used by the American Army consist of tanks, combat cars, armored cars, scout cars and other similar vehicles. Of these vehicles the armored cars and scout cars most nearly approach the design of commercial vehicles. Combat cars and tanks are in a single group and are highly special. There is no commercial vehicle comparable to the tank and combat car.

There are certain important characteristics in the design of a tank which lead directly to the selection of the most satisfactory engine for that design. These characteristics, in the order of importance, are the following:

1. Mobility.
2. Provision of a satisfactory firing platform.
3. Provision of adequate weapons.
4. Provision of observation facilities.
5. Weight.
6. Protection of the crew.

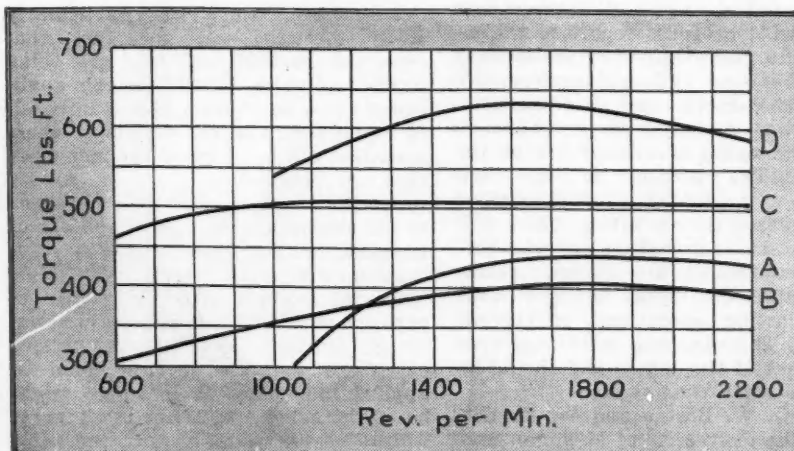
It is obvious that the engine enters into both mobility—that is, speed and grade-climbing ability without changing gears—and into weight. From experience, the most difficult things to provide are adequate mobility, satisfactory firing

platform, and minimum weight, which latter is desired in order that the tank may traverse secondary roads, including secondary and tertiary bridges. Further, it has been found that the weight of an armored tank of small size is approximately three-quarters of a ton per foot of length, while the weight of a larger size tank may run as high as one ton per foot of length. Therefore, the length of the vehicle is an important factor in determining its weight. The arrangement of the powerplants is a factor in determining the length. If a powerplant consists of a long, narrow engine, behind which are placed the transmission and final drive units, it is obvious that the vehicle will be long and hence of great weight. Whatever can be done to reduce the length of the combined powerplant, either by placing it side by side or by utilizing the space on each side of the powerplant for other purposes, will result in a reduction of the length of the vehicle. In doing this, it must be borne in mind at all times that a proper location of the center of gravity must be obtained, and that

the turret and weapon location must be kept as nearly above the center of gravity of the vehicle as practical, in order to provide maximum stability of the weapon. This consideration immediately leads to the search for an engine of short length.

In modern tanks the armor plate hull serves as a chassis, and since width adds but little to the total weight of the vehicle, since modern tanks are equipped with tracks and it is economical for the body to be of the same width throughout the length, a wide engine is acceptable. The height of the engine is only limited in that it increases the silhouette of the vehicle. From practical experience, an engine whose cross-section fits in a square is ideal, provided its length is the minimum. This leads to the selection, on physical measurements only, of the radial type engine. Recent design has utilized the radial engine placed at the rear of the vehicle, occupying the full space between the trucks, and placing the transmission at the front of the vehicle, allowing the driver and gunner to sit on opposite sides of the transmission, thus dividing the weight to obtain a satisfactory center of gravity of the vehicle and at the same time utilizing to a maximum the space inside the armored hull.

Early in 1928 a decision was reached to test a radial type air-cooled engine. In these early studies the general type of design just described had not yet been reached. This first attempt was made largely to secure the maximum horsepower per pound of engine, and at the same time reduce the hazard and complication which always result from the use of water-cooled engines in fighting vehicles. For the first test the Continental R-670 standard radial air-cooled, aircraft engine was selected. The first problem was one of cooling the engine. This was met by the design of a special fan. The next problem occurred after the en-



Here are shown torque curves of different models of the Continental R-670 engine

Combat Vehicles

engine had been assembled in the vehicle. In Fig. 1 are plotted a number of torque curves, all pertaining to the different models of the Continental R-670 engine. It will be noted that curve "A," which is of the engine originally installed in this vehicle, falls off on each side of the peak torque. This engine, while most satisfactory in an airplane, is hopeless when placed in a tank, as it requires constant changing of gears the moment a load is placed on the vehicle, causing the number of revolutions per minute to be reduced. In practice, it is necessary to drop almost to low gear and go through the full series of gears in order to obtain the full speed. The first serious problem, then, which presented itself was the correction of the torque curve. This was done by the Continental Motor Company by changing manifolding and valves, and as a result torque curve "B" in Fig. 1 was obtained. The peak torque in "A" was reduced, but a flat curve was obtained. The performance of this engine was excellent. Due, how-

ever, to certain other features of the design, the test was comparatively short.

In 1932 three additional projects were started utilizing radial, air-cooled engines. For this purpose the Continental R-670 engine was again selected. The first of these vehicles to be designed was to use the engine bored to develop 210 hp. Curve "C" shows the torque curve of this engine. It should be noted that the torque curves continue to flatten out. Also, it should be noted that this curve gives effective power from 1000 to 2000 r.p.m. At the same time a second project was started for which the same engine was to be used for two vehicles. This is the same engine as shown in Curve "C," except that the valving and manifolding were to be changed, the compression ratio raised, and the maximum normal speed increased from 2000 to 2400 r.p.m. When this was done the torque curve marked "D" resulted. This engine developed 257 hp., and developed a torque of 560 lb.-ft. from 1050 to almost 2400

r.p.m., with a peak of 620 lb.-ft. at approximately 1600 r.p.m. The compression ratio has been raised to 6.5 to 1, requiring a high test gas for its operation.

The results obtained with the engine whose torque curve is marked "D" were so satisfactory that the engine which immediately preceded it was modified to obtain the same results. These three engines were installed in full-track vehicles, ranging in weight from 1700 to 21,000 lb. In installing these engines full rubber suspension was used. Exceptionally good life has been obtained with a minimum of maintenance. The cooling of the last engines was successfully obtained through the cooperation of the Schwitzer-Cummins Company of Indianapolis, Ind., who designed an adequate cooling system.

Until some new development occurs in commercial engines, the radial, air-cooled engine has proved so satisfactory for the type of combat vehicle represented by the tank and combat car that its future for this purpose is assured.

Air Flow and Fuel Distribution

TESTS made for the National Advisory Committee for Aeronautics show that air flow in an engine cylinder, even of as low a velocity as 15-20 ft. per sec., has an appreciable effect on the distribution of the liquid fuel after injection cut-off. In still air the dispersion of the fuel particles following injection cut-off is exceedingly slow. Best distribution was effected by means of air flow and a high-dispersion nozzle. The results of the investigation are published in N.A.C.A. Report No. 483 (Effect of Moderate Air Flow on the Distribution of Fuel Sprays After Injection Cut-Off, by A. M. Rothrock and R. C. Spencer).

In the investigation, use was made of the high-speed photographic apparatus and injection system of the N.A.C.A. spray-photographic equip-

ment, which was altered to permit photographs to be taken at a rate of 300-500 per sec. This change permitted a study of the distribution of the spray during the period from cut-off to about 0.05 sec. after cut-off. The following conclusions were drawn from the results of the experiments:

In fuel-injection engines with quiescent combustion chambers and in which ignition takes place a considerable time after the end of injection, most of the fuel charge tends to penetrate to the side of the chamber opposite the injection nozzle and thus to concentrate in one part of the combustion space. Consequently, the final mixing of the fuel and air must be accomplished through vaporization and diffusion of the fuel vapors, through the use of air flow,

or through both of these actions.

After spray cut-off, air flow at velocities as low as 15 or 20 ft. per sec. is effective in promoting good distribution of the fuel in the liquid phase.

If low-velocity air flow is used and the fuel is to be distributed in the liquid phase, it is very important that the fuel be well broken up during the injection process. Therefore, nozzles of some high-dispersion type are to be preferred in both spark-ignition and compression-ignition engines.

Increasing the air density, the injection pressure, or the distance which the spray travels before meeting the moving air increases the initial fuel-jet disintegration produced by the nozzle and aids distribution by air flow.

The Forum

The Case for the 30 Hr. Week

Editor, AUTOMOTIVE INDUSTRIES:

Your author of economic fiction concerning business horizons states, in the issue of Oct. 20, that the 30-hr. week is asked for on the assumption that we cannot consume all that we produce. He then quotes statistics to prove that we could have consumed much more than we did and hence the 30-hr. week request is ridiculous. No doubt Mr. Lawrence will deny that a shorter work week would make room for more workers and hence more consumers. Perhaps he will also deny that shorter hours would tend to produce a scarcity of labor and lead to higher wages and greater consuming power by the mass of people who work. Labor knows that it can consume what it produces only if it is on the payroll and gets wages that are sufficiently high and it is on that basis that it advocates the 30-hr. week.

Mr. Lawrence claims that an increase in wages would not benefit the worker since it would have to be accompanied by an equal increase in prices. Since wages are only part of the cost, this statement is obviously not true. Even if it were true, doubling costs and prices would double the profit in dollars and hence stimulate business employment, which would benefit unemployed labor and relieve the charity load on employed labor.

The contention that shorter hours must lead to a cut in production is also erroneous. The total number of man hours may be maintained or even increased with the shorter work week by using the unemployed and part time workers. The output per man hour has been raised by the introduction of better machines. Better management and planning would permit a higher output per man hour by eliminating useless work, delays, etc. An increase in efficiency could easily make up for a decrease in hours, so there need be no decrease in production. But even a decrease in production need not result in a decrease in our consumption provided the decrease in production was limited to that part of our production exported for worthless I.O.U.s.

That the automotive industry pays to its workers 20c. and to suppliers of material 58c. out of every dollar that it receives is supposed to prove that labor's consuming power is not important. This argument would be quite plausible if we could be so naïve in accepting assumptions as Mr. Lawrence is in making them. Merely assume that the producers of material had no labor costs and the argument looks valid. An assumption a day keeps the truth away?

Dividends and surpluses are defended

on the ground that a high percentage of them go into the capital goods industry, the revival of which is assumed to be essential to recovery. Dividends and profits are increasing but the statisticians tell us that they seem to be

"Sheltered" Industries

Editor, AUTOMOTIVE INDUSTRIES:

I have just been reading your issue of Oct. 27 and was very interested in the article entitled "The Horizons of Business." While agreeing with what you say generally I think in one or two cases you have omitted certain logical arguments.

In your remarks about the bricklayers of New York City I think it would be only fair to suggest that the bricklayers in New York lay a far greater number of bricks per hour than they do in this country, and that the Building Trades in America are paid by results, whereas in this country the Building Trade is one of those which are not paid by results.

Again, generally through your article you have not taken account of the difference in the position of a "sheltered" as against an "unsheltered" industry.

Of course in this country all the Building Trades are "sheltered," that is to say there is no outside competition. One cannot buy a brick house complete and drop it into its desired position. Nearly all the professions such as teachers are "sheltered." Practically all the Retail Trades are "sheltered," and in point of fact an examination of the conditions of industry generally in the United States would show that the "sheltered" industries are living to some extent on the better economic condition of "unsheltered" trades and professions. A similar condition exists where trades are subsidized by heavy import duties, and there is no doubt that if the United States was to reduce its import duties generally the prices of certain commodities would fall substantially and the wages paid to labor would be much reduced.

H. AUSTIN,
Austin Motor Co., Ltd.,
Birmingham, England.

swelling bank deposits and reserves and that they are not going to industry. Even if they were going into the capital goods industry, the benefit to labor would be short lived, for no sooner would the new "labor saving" machinery start operating than the park benches would start to fill up with the displaced workers. Not until management learns how to utilize fully the present plan and equipment will it be in order to create more plants.

If one brushes aside the flimsy assumptions that mar our vision, we can see that the logical way to increase the standard of living is to provide work for all able to work, and to pay them enough to purchase more of the output than formerly. An increase in real wages may give Mr. Lawrence apoplexy but nevertheless it would be the salvation of the country, at least in the near future.

When one realizes that in 1929 1/10 of 1 per cent of the families in the United States had an income equal to the aggregate income of 42 per cent of the families in the lower income brackets, it is not difficult to see the necessity for a wage increase if the mass of the people are to receive enough to enable them to purchase what has been produced and which could partly fill their needs. For obviously the 1/10 of 1 per cent of the families who have the high incomes cannot consume 420 times as much per family as those in the lower income brackets. Their natural refusal to purchase what they cannot use causes the goods to pile up.

When one realizes that 2.3 per cent of the families did 67 per cent of our saving in 1929, the argument that dividends should be increased so that they could save more and still further increase their income at the expense of labor's wages causes my indignation to rise above the horizons of business.

ADOLPH MOSES.

Editor's note—Both sides of the 30-hr. week issue having been discussed in these columns, we hesitate to prolong the argument. However, we feel we should point out that the 30-hr. week proposal—if it can be enforced—means that any business enterprise which can't absorb a further one-third increase in labor costs at this time, must pass out of the picture.

In this connection, it is pertinent to quote David Cushman Coyle writing in the current issue of Harper's. He says: "There was never any possibility of a recovery of business simply by the direct effect of shortening hours and raising wages. So long as there are in any industry many different concerns with varying levels of efficiency the limitations of hour and wage regulation are narrow. Any code that would cause a considerable rise in weekly wages must bear fatally on the less efficient plants long before it can draw

seriously on the resources of the more efficient. When that happens the less efficient plants will close down, throwing men out of work, or they will protest to Washington and get a relaxation, or they will chisel, or they will obtain an agreement to raise prices. Any attempt to distribute consuming power directly by regulating hours and wages has a quick-acting law of diminishing returns."

What Mr. Coyle says applies very directly to the automotive industry as any one knows who is familiar with its current financial statistics. As to higher prices to pay higher labor costs, the industry's experience with raising prices last spring, indicates that it can't be done except at a sacrifice of volume with resultant still higher costs, and more important, less employment.

Notes on Consumer's Research

Editor, AUTOMOTIVE INDUSTRIES:

After driving automobiles for over 30 years, and at the present time covering over 30,000 miles per year, I believe my experience allows me to criticize the design and performance of the product that the automobile manufacturers offer us.

General Motors Consumer's Research shows that the average driver voted for dependability, first, operating economy, second, safety, third, appearance, fourth, and comfort, fifth. Without completing their list, I wish to take issue with the average driver, who uses his machine probably less than one-half as much as I do mine, and substitute my personal opinion as follows:

1. Dependability
2. Safety
3. Ease of control
4. Comfort
5. Smoothness
6. Pick-up
7. Speed
8. Operating economy
9. Appearance
10. Low list price.

Whether others agree with my classification or not is unimportant, but how the present-day automobile falls down with respect to some of these qualities is important.

Under the first heading, dependability, the basic mechanism is excellent, but the minor and adjunct equipment leaves much to be desired. Touching the high spots, we can mention inadequate electrical equipment, from batteries and generators of too small capacity, to sloppy and insufficiently-insulated wiring. To one who travels, a battery going dead on the road is just as serious as a burned out connecting rod bearing. Next come clutches. These could be very simply improved by a slight

increase in size so that they would last almost indefinitely, instead of 25,000 to 30,000 miles. And they could be made much smoother. An oversize, smoothly working clutch requires no automatic clutch control, even with an inexperienced driver.

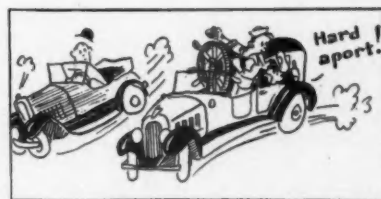


Under safety, I have two very serious objections. One is roadability, and the other is brakes. Taking up the latter first, I can quote an example. I owned two cars of the same make, one a 1929 and the other a 1933 model. The first, with an actual maximum cruising speed of about 55 m.p.h. had excellent brakes, after they were relined with a much better (and expensive) lining, up to the speed that could be used comfortably. (By "speed" I refer to actual speed, not the usual speedometer miles). The 1933 car brakes were inferior to the 1929, yet the cruising speed was better than 70, and the actual top speed was slightly above 80 m.p.h. The brakes used on the two most popular lowest price cars are both harsh and require too much pedal pressure in my opinion. The feeling of safety at high speeds that I have from 15-in. diameter, hydraulic, vacuum-booster-operated brakes on my present 4300-lb. car, the freedom from frequent adjustment, the velvety touch required to slack down at any speed, is the main reason why I continue to use this car.

Roadability is so lacking in most of the cars I have used that it is remarkable that there are not more accidents. Almost any car will hold the road on dry, smooth concrete, but it is an entirely different matter on wet brick or macadam, to say nothing about ice. And cars seem to be getting

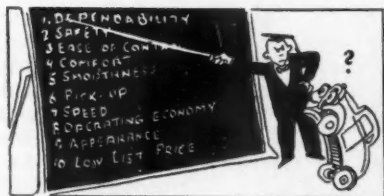
worse rather than better in this respect. Compare the modern car to an old Marmon Model 34 on a slippery road. A 1922 job that I owned, with an engine almost entirely of aluminum, set far back of the front axle, with a weight distribution of 200 lb. more on the rear wheels than on the front, could be driven with greater safety at 40 m.p.h. than my 1930 (heavier car) or my 1933 (same weight) at 25 m.p.h., on slippery pavements. I never had trouble getting up a slippery hill, or spinning my wheels when starting on a slight up-grade covered with ice. One of the highest-price cars is particularly bad in this respect, having a heavy, chunky engine well forward. To one who must use his car over all sorts of roads and in all kinds of weather, this is a feature of tremendous importance, as the physical strain of keeping a skidding car on the road is tremendous, even though you have sufficient confidence in your skill to be sure that you won't go into the ditch, no matter how the car slews around.

Bad steering is another feature that I have found on some modern cars. Too high a ratio, so that you must wind up the wheel to take a turn; inability to track, so that passing another car on a wavy, narrow road at high speeds is nerve racking, and wheel fight on rough roads are all faults that are present in many cars, and can be corrected. There is no reason why all cars cannot have quick steering for emergencies, ability to drive "hands off" for several hundred yards on smooth concrete at any speed, and still have reasonable parking facility. It can be done, provided the manufacturers spend a few pennies more on this important item, using more anti-friction bearings, heavier steering gears, and larger king pins, to minimize wear and maintain correct steering geometry. Parking my 4300-lb. car with 6.5-in. tires requires no more effort than any of the light 1933 and 1934

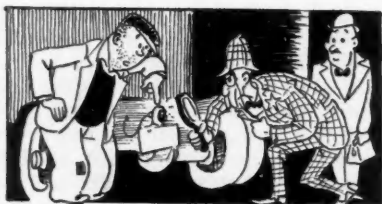


cars that I have used, and the steering is more responsive. I have combined safety with ease of control, but, then, these two are so bound up together that it is difficult to separate them.

Under ease of control, but not directly allied with safety, is the position of the parking brake. A long lever, within easy reach, right next to the gear-shift lever, is a great comfort when holding a car on an up-grade at a stop light. Any one who has driven around the Pittsburgh district will appreciate this feature. And how it minimizes wear on clutches and allows you to be first off when the light turns green!



A short travel of the gear shift, also desirable, is lacking in several popular cars. Pedals too close to the steering column, and the brake pedal too close to the accelerator, too heavy a spring on the accelerator, with too short a travel in the lower speed range, are other points that are important to one who drives long distances. I have driven only a few cars that did not tire my right leg after several hours behind the wheel. Foot control of the dimmer, with an easily visible tell-tale to indicate when the lights are dimmed or depressed, would minimize the glaring-headlight danger. Our lighting technique has not yet progressed sufficiently so that we can get adequate light penetration without considerable glare, and any speed is dangerous that does not permit the driver to stop within the distance of



his head-light illumination. Cars and trucks with infinitesimal tail lights stop only too frequently on the highway, and every one who has driven frequently at night has had close escapes from this cause. I personally believe that two adequately bright tail lights should be required legally.

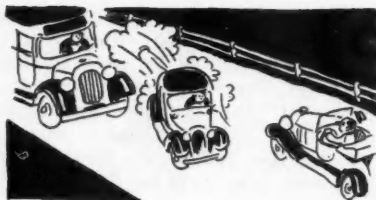
Again it is almost impossible to separate comfort and smoothness, as they are practically allied. I personally believe that the greatest improvement in modern cars is in comfort. Two-way shock absorbers, quiet bodies and chassis, adjustable seats, and practically vibrationless engines are results upon which the industry is to be congratulated. One feature that is particularly desirable for the high-speed driver is an overgear step-up drive. I have not had experience with the Auburn two-speed axle or the new Chrysler automatic planetary overgear, but I have had a four-speed transmission with a quiet second, direct drive on third, and a quiet over-drive fourth. This was a tremendous improvement, easily operated, and it increased the average speed by over 7 m.p.h. without an increase in top speed ability. On level roads it was used almost entirely, even at 20 m.p.h. Contrary to expectations, the higher average top speeds did not result in an increase in fuel consumption. My present four-speed transmission, with an extra low, is an abortion, compared to the over-drive type. To my mind, the additional smoothness and performance obtained by this method is well worth the slight additional cost, and the method seems simpler than a two-speed axle or an automatic planetary step-up. The ease of shifting from over-drive to direct or second allows

the full use of this transmission by all types of drivers, even by women who usually do not care to shift. The use of such a transmission requires a slightly slower rear axle ratio than used at present, to get the maximum advantage.

Pick-up and speed are also discussed as one. Modern cars have very much higher top speeds than 90 per cent of the drivers can use safely, even on straight concrete roads. And the temptation to use these high speeds is well-nigh irresistible. Extremely dangerous for the average driver, combined with the usually inadequate brakes and inferior steering that so many modern cars have, the "high speed" advertising that we see so much of is to be regretted. I know from experience that a high average speed, without excessive top speed, can be maintained with less powerful engines combined with an over-speed transmission.

The only pick-up ability required is at a speed where even the powerful modern cars are lacking. Pick-up at from 5 to 25 m.p.h. in high gear looks well in advertisements, but is done better in second. Acceleration from 40 to 60 m.p.h. is important. Passing a string of cars travelling at 40 to 45, *fast* is the only safe method of passing. And it is at this time that I have found that cars have insufficient acceleration. Two methods of improving cars in this respect are known. The use of a super-charger seems ideal for this purpose. Further development of this should be undertaken.

So much for performance, and now a few remarks on bodies. Why not provide sensible door pockets where maps and gloves can be conveniently kept; a pocket on each door, instead of on one only; a rattle-proof bracket on the steering column for an easily getatable flash light; a side-view mirror that is part of the car instead of an accessory;



felt lining in the dash locker, to prevent rattles of the loose articles usually carried; an oil-can bracket for the convenient carrying of the small, easily-obtainable can of 3-in-1 oil, not under the hood, but inside, where it will be clean to handle; a break in the floor molding, so that dirt can be brushed out (instead of trying to brush it over the door sill, an impossibility); a battery compartment where one can check the battery without taking a half hour to rearrange the floor mat; leather trim at the bottom of the doors where the upholstery is quickly ruined by dirty shoes; an easily removable rear half of front floor mats, so that they can be removed and really cleaned; built-on bumper guards, so necessary

with the new type of fenders, and either a built-in heater or facilities for the easy installation in a position sufficiently low and central so that the driver gets some benefit from it and all the heat does not go up under the cowl?

The saving I have experienced from a cross-flow radiator, both with alcohol and prestone, has made me a convert to that type. This type does not overflow after a long high-speed run, and thus does not waste expensive prestone the way the standard type of



radiator does. One key for ignition, doors, dash compartment, and spare tire is essential. Snap buttons provided on the car, so that seat covers can be installed and removed easily, are more than a convenience to one who wishes to protect the upholstery and also keep the covers clean. In open cars, whether it is a Ford or a Cadillac, there is no place to store the curtains properly. A rear compartment foot rest, in the shape of a box, where the jack, handle, wheel wrench, cotter pins, and work gloves can be getatably stowed, was a tremendous convenience in an old car, and many times wished for in my more modern cars.

As to operating economy I have very little to say. As to fuel consumption, no one to whom this is a major item would buy a heavy, high-priced 12 or 16-cylinder car. As it is axiomatic that parts for high-priced cars are infinitely more expensive than for low priced, this is an extremely important point that must be considered when deciding what price-class car to purchase, even when a high-priced class used car is as inexpensive in first cost as a low-priced new car. I have been "stung" with \$35 fenders and \$15 springs, so I know.

There is no question that appearance sells cars, and I believe that in this, and in low price, the manufacturers are to be congratulated. However, I want to register a complaint on list prices. Let the manufacturers quote them for cars completely equipped with bumpers and spare tires. We buy them that way, so why not quote them complete. There is too much variation between the f.o.b. price and the delivered price on different makes of automobiles. I admit that this is of relatively small importance, as everybody gets the delivered dealer price before making comparisons.

Consumers research is excellent, but there are "lots of things" required by those of us who practically live in our cars that the average pleasure user does not realize.

THEODORE MAYNZ.

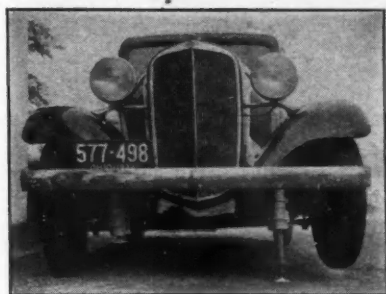
NEW DEVELOPMENTS

Automotive Parts, Accessories and Production Tools

New Dash-Controlled Automatic Hydraulic Jack

The Dash-o-matic Manufacturing Company, 871 London Road, Cleveland, Ohio, announces a new automatic hydraulic dash-controlled jack system. This system consists of four jacks mounted adjacent to each wheel and all controlled independently or simultaneously from a dial on the dash.

When a wheel is to be jacked up, the driver sits in his seat, turns the indi-



cator on the dial to the position for the wheel it is desired to jack up, adjusts a small button to open a control valve and a second button to throw in the clutch that engages the engine to a pump. The jack is immediately pumped up and the wheel lifted. To release the jack the control valve is again opened, the clutch again engaged and the jack is pumped down. Either jacking up or letting down the wheel, it is said, requires less than a minute and the operation is claimed to be simple, smooth, even, automatic and certain. It will jack up one wheel or all four at one time. The Dash-o-matic Jack System can be used to lift a car out of a rut or jack it up for storage. Each jack is about 10½ in. in length and 2½ in. in diameter, small, compact, and allows for ample clearance. The Dash-o-matic System is made in three sizes, two for large and small passenger cars and one for trucks and buses. The Dash-o-matic System, we are informed, is fully protected by patents.

Ohio Electric Specialties

Two new products have been announced recently by the Ohio Parts Company of Cincinnati. One is a new spark-plug cable known as Kopper-Kote No. 777, which is treated with a protective coating of copper-colored lacquer and is intended for particularly severe service, such as that on highway buses, trucks and tractors. The other is a new portable cord containing two rubber-covered conductors, supported

by a jute filler, over which are a rubber sheath and an outer fabric braid. The braid is approximately 1/32 in. thick and is impregnated with an oil- and moisture-proof compound. This cord is intended more particularly for reel lights and for general service use.

Counterpoises Up to 200 lb.

Chicago Pneumatic Tool Co., New York, N. Y., has brought out a new Super Safety Balancer, a simple but rugged counterpoise for suspending, balancing and lifting portable tools and other objects up to 200 lb. in weight.

Among the features of this balancer are: single cable with a safety factor of 10 to 1; long balanced travel due to use of tapered drum, single cable, and new method of applying spring



force; use of a mechanically operated geneva gear instead of clam stops.

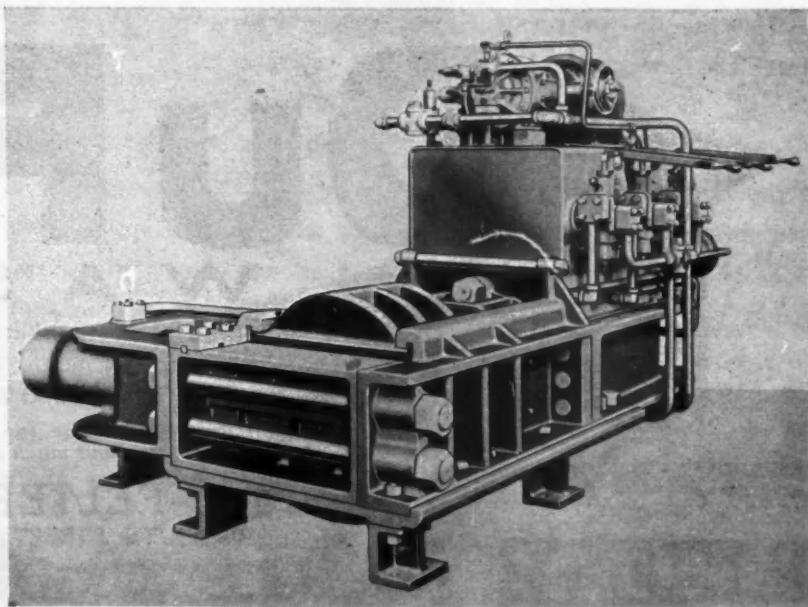
H-P-M Modernizes Baling Press

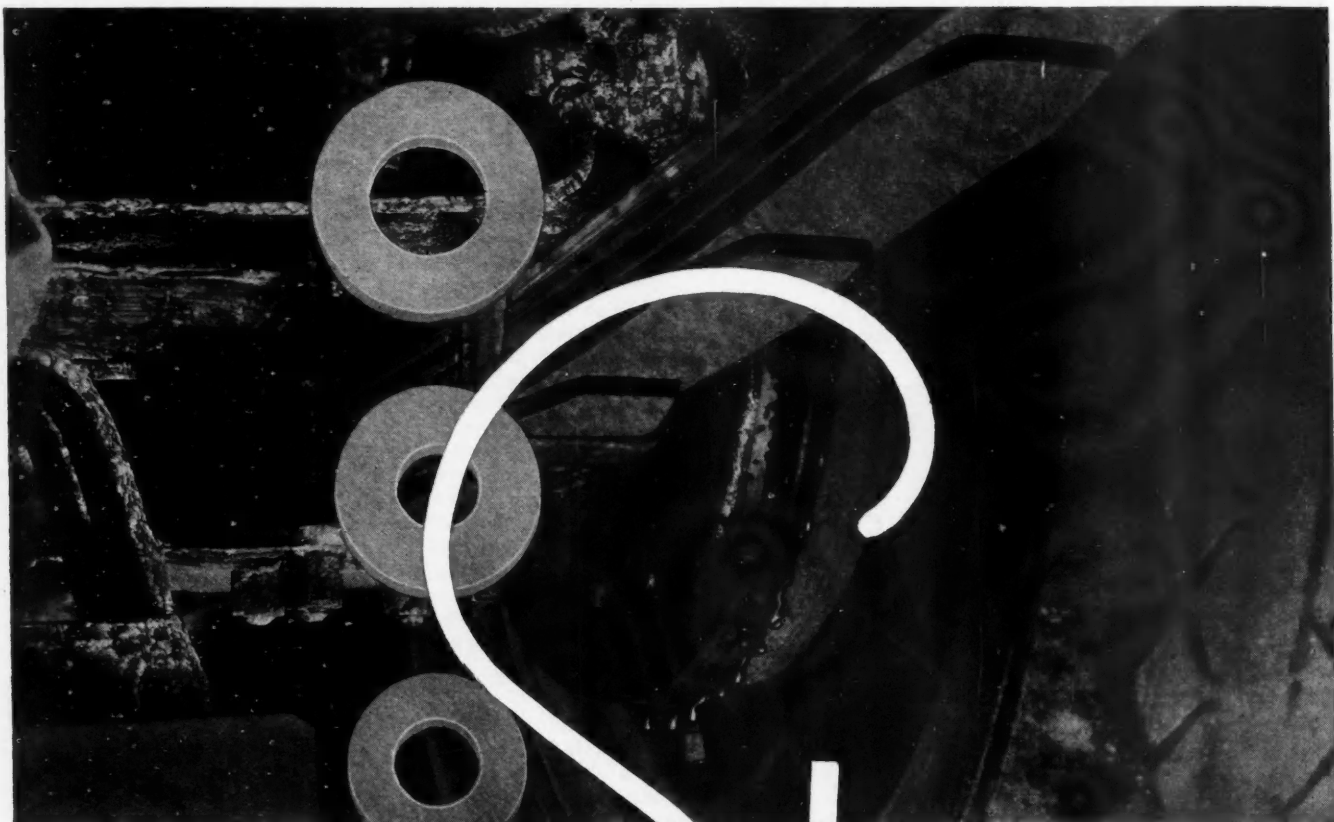
A recent development of The Hydraulic Press Mfg. Co., Mount Gilead, Ohio, is a box type scrap metal baling press, incorporating the H-P-M Hydro-Power principle of operation. It is completely self-contained with the motor driven power unit mounted directly on the press at one end.

Pressure is applied to the scrap

from two directions—first from the end, and then from the side by platens moving into the box operated by hydraulic rams. The application of the pressure is controlled through three lever actuated valves.

Two pumps, each of the rotary high-speed oil pressure type, build up the pressure. The first pump delivers a large volume of oil at medium pressure; the second pump, the new H-P-M variable delivery radial type, builds pressure up to maximum.





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uniformity of heat-treating characteristics, Bethlehem has brought to bear every resource of knowledge and skill. Bethlehem's experience on these problems has been acquired through years of living with the steel problems of the automotive industry.

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